Appendix F

FORTRAN COMMON BLOCK DOCUMENTATION

This appendix contains listings of the documentation files for the main include files and common blocks used by the weapon/target selection functional element. The listings are organized alphabetically by file name, as follows:

envdat
extst
fcstat
mind2
mind3
mind4
misdat
ppost
prjct
rdrsta

envdat

```
#NAME      ENVDAT
#PURPOSE   MISSILE FIRE CONTROL ATTRIBUTES
#AUTHOR    DICKERSON
#COMMENTS
 Note that the data in /envdat/ is specified by the first
 section of the envelope data, in which one line containing a launch
 mode name and bit masks for select, enable, and fire constraints appears
 for each valid launch mode.  The launch mode names are held in
 /fcdesc/lchmod and are set by subroutine fcdsdd.  The currently defined
 (as of 8 Mar 1993) launch modes are:
      PASSIVE_SEEKER_LOCK_IR
      PASSIVE_SEEKER_LOCK_RF
      SEMI_ACTIVE_SEEKER_LOCK
      CMD_GUIDED_UNDES_VIS
      CMD_GUIDED_UNDES_IRST
      CMD_GUIDED_DES_RDR
      CMD_GUIDED_DES_ITB
      CMD_GUIDED_DES_STT
      CMD_GUIDED_DES_TWS
      DES_RDR_SKR_NOT_LOCKED
 These names are stored in /fcdesc/lchmod, which is initialized by subr
fcdsdd.
 The bits used in the bit masks defining the select, enable and fire
 constraints are defined in /par/.  The bits currently defined
 (as of 8 Mar 1993) are:
    PARAMETER    MEANING                              (BIT NUMBER)
      pskrlk    Denotes seeker must be locked on target       (1)
      prdrst    Denotes radar must be in STT                  (2)
      prdrtw    Denotes radar must have TWS track             (3)
      prdrtk    Denotes radar must have TWS or STT track(4)
      pirstk    Denotes irst must have track                  (5)
      prvis     Denotes pilot must have recent visual         (6)
      pstall    Denotes that aircraft AOA must not be above (7)
                missile maximum AOA (i.e. launcher must not
                be in missile post-stall regime)
      prwtk     Denotes rwr must have track                   (8)
      pborst    Denotes target must be boresightet            (9)
      prwrwv    Denotes target radar must be emitting between (10)
                between min and max wavelength
      pitb      Denotes ITB must have a track                (11)
      prng
#CONSTANT DESCRIPTION
 MXLNCH       INT - Maximum number of launch modes for a single missile.
 LEN_ENVDAT   INT - Length /envdat/.
 LEN_SUP_ENV1 INT - Length /sup_env1/.
 LEN_SUP_ENV2 INT - Length /sup_env2/.
#VARIABLE DESCRIPTION - /envdat/
 ENVDAT_CPTR  PTR - pointer to current /ENVDAT/ block
 MENVLP       ARRAY DIM(LENVP) OF (REAL) - Equivalenced to the first word
                of /envdat/ after the currency pointer.
 SELTST       ARRAY DIM(MXLNCH) OF (INT) - Bit mask specifying required
                tests in weapon selection for each launch mode.
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 MMTST          ARRAY DIM(MXLNCH) OF (INT) -  Bit mask specifying required
                tests in weapon enabling for each launch mode.
 FIRTST         ARRAY DIM(MXLNCH) OF (INT) -  Bit mask specifying required
                tests in weapon firing.
 PLNCH          ARRAY DIM(MXLNCH) OF (INT) - Index of launch mode name in
                FCDESC (NOT USER INPUT)
 NLNCHM         INT - Number of launch modes defined. (NOT USER INPUT)
 SUP_ENV_PTR    PTR - Pointer to appropriate supplimental envelope data.
                If /misdat/kndenv=1, this points to /sup_env1/.
                If /misdat/kndenv=2, this points to /sup_env2/.
#VARIABLE DESCRIPTION - /sup_env1/
!! the following variables apply only to missiles with /misdat/kndenv=1
!! the standard BRAWLER envelope specification
 SUP_ENV1       ARRAY DIM(LEN_SUP_ENV1) OF (REAL) - Equivalenced to the
                first word of /sup_env1/.
 RMNLO          ARRAY DIM(3,2) OF (REAL) - Minimum firing range
                against non-maneuvering target at sea level,
                specified for nose, beam, and tail shots and for
                subsonic and supersonic launcher.  See subroutine
                ENVLP1 for usage.
 RMXLO          ARRAY DIM(3,2) OF (REAL) - Maximum firing range
                against non-maneuvering target at sea level,
                specified for nose, beam, and tail shots and for
                subsonic and supersonic launcher.  See subroutine
                ENVLP1 for usage.
 RMNHI          ARRAY DIM(3,2) OF (REAL) - Minimum firing range
                against non-maneuvering target at alt. 'ralt',
                specified for nose, beam, and tail shots and for
                subsonic and supersonic launcher.  See subroutine
                ENVLP1 for usage.
 RMXHI          ARRAY DIM(3,2) OF (REAL) - Maximum firing range
                against non-maneuvering target at alt. 'ralt',
                specified for nose, beam, and tail shots and for
                subsonic and supersonic launcher.  See subroutine
                ENVLP1 for usage.
 CRCF           ARRAY DIM(3,2) OF (REAL) -  Closure rate correction
                factor for RMAX.  Used in closure rate corrections of
                envelope computations.  CRCF is equal to the missile
                time of flight to RMAX.  Specified for nose, beam, and
                tail shots as well as subsonic and supersonic launcher.
                See subroutine ENVLP1 for usage.
 CRCI           ARRAY DIM(3,2) OF (REAL) -  Closure rate correction
                factor for RMIN.  Used in closure rate corrections of
                envelope computations.  CRCI is equal to the missile
                time of flight to RMIN.  Specified for nose, beam, and
                tail shots as well as subsonic and supersonic launcher.
                See ENVLP1 for usage.
 TGCOR          ARRAY DIM(6,3) OF (REAL) - Correction to envelope
```
maximum range for target 'gees'. Factor multiplies
range maximum. First index specifies nose, beam
and tail shots; second indicates target g's of 2.,
3., 4., 5., 6., and 6.5 (wing loading). See
subroutinte ENVLP1 for usage. Program is currently

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'hardwired' to use 4 gees.

AOFALT   REAL - Break point for beam/tail aspect at altitude
          'ralt'. Effectively defines what is meant by tail
          for variables such as GMOD. See subroutine ENVLP1
          for usage.

AMACHV ARRAY DIM(2) OF (REAL) - Mach values specifying what
          is meant by subsonic and supersonic launcher speeds for
          variables such as RMNLO, RMXHI, etc. See subroutine
          ENVLP1 for usage.

RALT   REAL - Altitude at which RMNHI and RMXHI are
          specified. See ENVLP1 for usage.

GALT   REAL - Altitude for change in g effects. See
          ENVLP1 for usage.

GMOD   REAL - Correction to maximum range for g effects in
          high altitude stern attacks. See ENVLP1 for usage.

#VARIABLE DESCRIPTION - /sup_env2/
!! the following variables apply only to missiles with /misdat/kndenv=2
!! the F-15 HUD algorithm

SUP_ENV2   ARRAY DIM(LEN_SUP_ENV2) OF (REAL) - Equivalenced to the
          first word of /sup_env2/.

ENMLID   REAL - Missile selection index

TB   REAL - Time at end of boost

TS   REAL - Time at end of sustain

TFMIN   REAL - Lower bound for missile time of flight

TFMAX   REAL - Upper bound for missile time of flight

TLD   REAL - Launch delay time

CDB   ARRAY DIM(4) OF (REAL) - Constants for boost drag parameter
          calculations

CDS   ARRAY DIM(4) OF (REAL) - Constants for sustain drag parameter
          calculations

CTB   ARRAY DIM(2) OF (REAL) - Constants for boost acceleration
          parameter calculations

CTS   ARRAY DIM(2) OF (REAL) - Constants for sustain acceleration
          parameter calculations

CDA   ARRAY DIM(4) OF (REAL) - Constants for air density adjustment
          for altitude change

CDG   REAL - Constant for dg calculation

CDGA   ARRAY DIM(4,2) OF (REAL) - Constants for cdg1 & cdg2
          calculations, used only for missile index=1

CVMN   ARRAY DIM(2,2) OF (REAL) - Constants for velocity assymptote
          calculation

CTA   REAL - Target acceleration coefficient

CVGI   REAL - Velocity increment at guidance initiate

CGL   ARRAY DIM(2) OF (REAL) - Gimbal limit constants

CML   ARRAY DIM(2) OF (REAL) - Mach limit constants

CGI   ARRAY DIM(4) OF (REAL) - G-limit constants

CVC   ARRAY DIM(3) OF (REAL) - Constants for closing velocity
CSA   REAL - Speed advantage constant
CR   ARRAY DIM(2) OF (REAL) - Constants used to solve for minimum
          launch range
CSM   ARRAY DIM(2) OF (REAL) - Constants used to solve for minimum
          launch range
CMN   ARRAY DIM(12) OF (REAL) - Constants used to solve for minimum
          launch range

!! the following variables apply only to missiles with /misdat/kndenv=3
#CONSTANT DESCRIPTION
mx_spds   int - Maximum number of Machs in tables which follow.
mx_alts   int - Maximum number of altitudes in tables which follow.
mx_elv   int - Maximum number of elevations in tables which follow.
mx_asp   int - Maximum number of aspects in tables which follow.
mx_se   int - Maximum number of steering errors in tables which follow.

#VARIABLE DESCRIPTION - /sup_env3/

        MINIMUM RANGE VARIABLES.
r_se0_mn   array dim(mx_spds*mx_spds*mx_alts*mx_elv*mx_asp) of (REAL) -
                Minimum range for zero steering error.
sefac_mn   array dim(mx_spds*mx_spds*mx_alts*mx_elv*mx_asp*mx_se) of (REAL) -
                Multiplicative correction factors for non-zero steering error.
r_se0_mn_p array dim(mx_elv,mx_alts) of (PTR) - Pointers to beginning of
                data in r_se0_mn for a given elevation and altitude.
sefac_mn_p array dim(mx_elv,mx_alts) of (PTR) - Pointers to beginning of
                data in sefac_mn for a given elevation and altitude.

        Following are indexing arrays for preceding tables:
sa_l_mn   array dim(mx_spds) of (REAL) - List of attacker Machs for Rmin
                and sefac_mn tables.
sa_n_mn   int - Number of attacker Machs for rmin0 and sefac_mn tables.
st_l_mn   array dim(mx_spds) of (REAL) - List of target Machs for rmin0
                tables.
ha_l_mn   array dim(mx_alts) of (REAL) - List of attacker altitudes for Rmin
                tables.
ha_n_mn   int - Number of attacker altitudes for Rmin tables.
el_l_mn   array dim(mx_elv,mx_alts) of (REAL) - el_l_mn(i,j) is the i'th
                elevation for the j'th attacker altitude, i.e. the list of target
                elevations depends upon the attacker altitude.
el_n_mn   array dim(mx_alts) of (REAL) - List of number of elevations
                for each altitude.
asp_l_mn   array dim(mx_asp) of (REAL) - List of target aspects for Rmin table.
asp_n_mn   integer - Number of target aspects for Rmin table
se_l_mn   array dim(mx_se) of (REAL) - List of steering error values for

sefac_mn table.

se_n_mn   integer - Number of sterring error values in sa_l_mn table.

MAXIMUM RANGE VARIABLES.

r_se0_mx   array dim(mx_spds*mx_spds*mx_alts*mx_elv*mx_asp) of (REAL) -
            Maximum range for zero steering error.

sefac_mx   array dim(mx_spds*mx_spds*mx_alts*mx_elv*mx_asp*mx_se) of (REAL) -
            Multiplicative correction factors for non-zero steering error.

r_se0_mx_p array dim(mx_elv,mx_alts) of (PTR) - Pointers to beginning of
            data in r_se0_mx for a given elevation and altitude.

sefac_mx_p array dim(mx_elv,mx_alts) of (PTR) - Pointers to beginning of
            data in sefac_mx for a given elevation and altitude.

Following are indexing arrays for preceding tables:

sa_l_mx   array dim(mx_spds) of (REAL) - List of attacker Machs for Rmax
            tables.

sa_n_mx   int - Number of attacker Machs for Rmax tables.

st_l_mx   array dim(mx_spds) of (REAL) - List of target Machs for Rmax tables.

ha_l_mx   array dim(mx_alts) of (REAL) - List of attacker altitudes for Rmax
            tables.

ha_n_mx   int - Number of attacker altitudes for Rmax tables.

el_l_mx   array dim(mx_elv,mx_alts) of (REAL) - el_l_mx(i,j) is the i'th
            elevation for the j'th attacker altitude, i.e. the list of target
            elevations depends upon the attacker altitude.

el_n_mn   array dim() of (integer) - Number of elevations for each altitude.

asp_l_mx   array dim(mx_asp) of (REAL) - List of target aspects for Rmax table.

asp_n_mx   integer - Number of target aspects for Rmax table

#SLOT/VARIABLE/DESCRIPTION   Equivalences for array !
####
#AUDIT
C PART-INCLUDE BY ELazarus ON 07-Oct-93 09:47:40 Thu FROM TASK newlar
C MODIFIED BY ELazarus ON 16-Jun-93 14:51:58 Wed FOR TASK newlar
C MODIFIED BY ELazarus ON 15-Jun-93 09:34:35 Tue FOR TASK newlar
C Added third envelope specification.
C PART-INCLUDE BY Kramer ON 24-Apr-92 14:27:56 Fri FROM TASK bugfix8
C MODIFIED BY Kramer ON 24-Apr-92 10:58:56 Fri FOR TASK bugfix8
C Corrected calculation of len_envdat. It was 1 too long
C PART-INCLUDE BY Kramer ON 18-Jan-91 15:31:59 Fri FROM TASK msl_eng
C MODIFIED BY Kramer ON 09-Jan-91 16:59:45 Wed FOR TASK new_misl
C Reorganized include to remove equivalences.
C Also renamed currency pointer.
C MODIFIED BY Lazarus ON 04-Jan-91 13:18:24 Fri FOR TASK msl_eng
C Redefined lmenv1 and lmenv2 to be total length for each type
C of specification.
####

extst

```
#NAME     EXTST
#PURPOSE  Stores external status of all aircraft
#AUTHOR   Kerchner
#CONSTANT DESCRIPTION
 LEXTST  INT - Length of the common /EXTST/
 LEXTSC  INT - Length of the common /EXTSTC/
 EXTX    INT - Index of XE in common block, used in graphics interpolation
 EXTV    INT - Index of VE in common block
 EXTA    INT - Index of AE in common block
 EXTRWE  INT - Index of RWE in common block
 EXTWB   INT - Index of WB in common block
 EXTALP  INT - Index of ALPHA in common block
 EXTALV  INT - Index of ALIVE in common block
 EXTNAC  INT - Index of NACTOT in common block
 EXTFGG  INT - Index of FGG in common block
 EXTFAB  INT - Index of FAB in common block
!Following are enumerations for updmod
 UNSPEC     INT - 0, indicates A/C flown by unspecified process
 BRWLR      INT - 1, indicates A/C flown by Tac Brawler
 DOME       INT - 2, indicates A/C flown by dome (manned simulator)
 AUXSTN     INT - 3, indicates A/C flown by auxiliary station
 CONFED_SIM INT - 4, indicates A/C flown by another simulation
              (like EADSIM), running in a confederated mode with BRAWLER
#VARIABLE DESCRIPTION
 SVTIME  ARRAY DIM(MAC) OF (REAL) - State vector times (seconds)
 XE      ARRAY DIM(MAC) OF (3-VEC) - Inertial position vectors (feet)
 VE      ARRAY DIM(MAC) OF (3-VEC) - Inertial velocity vectors
(ft/sec)
 AE      ARRAY DIM(MAC) OF (3-VEC) - Inertial acceleration vector
            (ft/sec)*(ft/sec)
 RBE     ARRAY DIM(MAC) OF (ORIENT) - Earth-to-body rotation matrix
                                    - convention is  Vb=[RBE]Ve
 RWE     ARRAY DIM(MAC) OF (ORIENT) - Earth-to-wind rotation matrix
                                    - convention is  Vw=[RWE]Ve
 WB      ARRAY DIM(3,MAC) OF (REAL) - Body rotational rates (rad/sec)
 ALPHA   ARRAY DIM(MAC) OF (REAL) -  Angles of attack (radians)
 ACMASS  ARRAY DIM(MAC) OF (REAL) - Mass of aircraft (slugs)
 FUEL    ARRAY DIM(MAC) OF (REAL) - Amount of fuel remaining (slugs)
 SPEED   ARRAY DIM(MAC) OF (REAL) - Current speed (ft/sec)
 RADMIN  ARRAY DIM(MAC) OF (REAL) - Minimum turn radii (feet)
 WSQ     ARRAY DIM(MAC) OF (REAL) - Magnitude of omega squared
 WMAG    ARRAY DIM(MAC) OF (REAL) - Magnitude of Omega
 FMACH   ARRAY DIM(MAC) OF (REAL) - Speed in mach (mach)
 ISTORL  ARRAY DIM(MXDEV,MAC) OF (INT) - Level of stores
            /par/loctnk        = Number of tanks
            /par/locpod        = Number of pods
            /par/locmis        = Number of type 1 missiles
            /par/locmis+nummis-1 = Number of type nummis missiles
            /par/locgun        = Number of 0.5 second gun bursts
            /par/locexp        = Number of type 1 expendables
            /par/locexp+numexp-1 = Number of type numexp expendables
            /par/locpln        = Number of pylons
```

```
              /par/mxdev             =
numtnk+numpod+nummis+numgun+numexp+numpln
 ITYPE    ARRAY DIM(MAC) OF (PTR) - Pointers to type data
 IMIND    ARRAY DIM(MAC) OF (PTR) - Pointers to mental models
 TIMDED   ARRAY DIM(MAC) OF (REAL) - Time at which aircraft died.  Valid
              only if .not.alive(iac).  Negative if undefined.
 DYPRES   ARRAY DIM(MAC) OF (REAL) - Dynamic pressure
 ALIVE    ARRAY DIM(MAC) OF (LOG) - Flag indicating alive or dead
 NACTOT   INT - Number of aircraft in the simulation
 ARMNT    ARRAY DIM(NUMWPN,MAC) OF (INT) - Bit packed weapons descriptor
              for each weapon type for this aircraft.  The first
/par/nummis
              elements for each aircraft are for the allowed missile types
              and the last elements nummis + 1 to numwpn are for the gun.
              (Currently nummis +1 = numwpn).  Bits 1-3 from the right
denote
              kind-weapon index (1-4); bit 4 indicates all-aspect
capability;
              bit 5 indicates lookdown/shootdown capability and bits 8-10
              contain mphase(1).
 KILLER   ARRAY DIM(MAC) OF (AC-IND) - If dead, aircraft ID making kill
 ENTITY   ARRAY DIM(MAC) OF (INT) - Contains type of entity now conscious
              Legal values are in /par/ (see for example, /par/acent).
 NSAMST   INT - Number of sam sites
 AVDPTR   ARRAY DIM(MAC) OF (PTR) - Pointers to the avionics status
              information for each aircraft.
 FCPTR    ARRAY DIM(MAC) of (PTR) - pointers to fire control data for
/fcstat/
 AREA     ARRAY DIM(MAC) of (REAL) - aircraft reference area
 FGG      ARRAY DIM(MAC) OF (REAL) - Gas generator fraction (0-1).
              Indicates actual engine state i.e. 0 = idle and 1 = mil
power.
 FAB      ARRAY DIM(MAC) OF (REAL) - Afterburner fraction.  Indicates
              actual state of afterburner, i.e. 1= full ab, 0= minimum ab.
 MDCTRL   ARRAY DIM(MAC) OF (INT) - Reserved by RMK for future use
 DDPD     ARRAY DIM(MAC) OF (REAL) - Percent deployment of drag device
 TRPD     ARRAY DIM(MAC) OF (REAL) - Percent deployment of thrust
              reversal
 UPDMOD   ARRAY DIM(MAC) OF (INT) - Identifies "controller" of given
              aircraft.  See enumeration above

              Controller should mean who controls flight path.  We wish to
              exclude meanings that would preclude having, say,
consciousness
              events running but not doing maneuver decisions (or ignoring
              the results of maneuver decisions).  There is also a need to
              distinguish between controller of flight path and where
              avionics are modeled.  Theses considerations imply the need
for
              multiple flags, each associated with a different function
that
              Brawler may or may not be performing for a given platform.

 ECMLVL   REAL - Fraction of full ecm power level in environment
```

```
 BAREMS   ARRAY DIM(MAC) OF (REAL) - Mass of aircraft exclusive of fuel
 FREQP    ARRAY (AC-IDX) OF (REAL) - ROLL RATE CONTROL FREQUENCY (sec**-1).
          Roll response is modeled as:
                dp/dt + freqp*p = freqp*pstar
          where p is the actual roll rate and pstar is the commanded
roll rate.
          The above assumes, of course, that the limit rratmx is not
exceeded.
          NOTE: This variable is not realistically initialized until
after the
          first time>0 flyac call.  Users who need an accurate value
sooner
          should alter initac to provide realistic initialization.
 FREQQ        ARRAY (AC-IDX) OF (REAL) - PITCH RATE CONTROL FREQUENCY
(sec**-1).
          Pitch response is modeled as:
                dq/dt + freqq*q = freqq*qstar
          where q is the actual pitch rate and qstar is the commanded
rate.
          An analogous interpretation of freqq can be used if a second
order
          D.E. is used.  The above assumes, of course, that the limit
pratmx
          is not exceeded.
          NOTE: This variable is not realistically initialized until
after the
          first time>0 flyac call.  Users who need an accurate value
sooner
          should alter initac to provide realistic initialization.
 RRATMX   ARRAY (AC-IDX) OF (REAL) - MAX ROLL RATE (rad/sec)
          NOTE: This variable is not realistically initialized until
after the
          first time>0 flyac call.  Users who need an accurate value
sooner
          should alter initac to provide realistic initialization.
 PRATMX   ARRAY (AC-IDX) OF (REAL) - MAX POSITIVE PITCH RATE (rad/sec)
          NOTE: This variable is not realistically initialized until
after the
          first time>0 flyac call.  Users who need an accurate value
sooner
          should alter initac to provide realistic initialization.
 EXPRFM   ARRAY DIM (MANTEN,MAC) OF (INT) - Current PRF mode of each
          antenna.  If antenna is OFF, exprfm contains the last PRF
          mode used.  For a gimballed radar, PRF should be 2 for medium
          PRF or 3 for high PRF.  For an ESA radar, this is the number
of
          the waveform that the radar last emitted (range is 1 to
/rdrdat/mxwfrm)
 JSIDEA   ARRAY DIM(MAC) OF (CHAR*4) - Side of the aircraft
 ALRATE   REAL - AOA rate.
 CRNRV    ARRAY DIM(MAC) OF (REAL) - Result of the last corner velocity
          calculation (see function corner).
 NNOFLY   INT - Number of non-flying entities in /EXTST/; i.e. pure GCI's
          and CIC's.
```

```
 C2FUNC  ARRAY DIM(MAC) OF (LOG) - .true. if the aircraft has a GCI
            controller.  i.e. .true. for AWACS and GCI sites.
 GCMNDP  ARRAY DIM(MAC) OF (PTR) - Pointers to gci mental model.  Only
            valid for GCI and AWACS.  Set to -1 if not valid.
 DAMAGE  ARRAY DIM(MAC) OF (INT) - Flag for damage satus of aircraft
            0 = no damage
            1 = damaged
 CEV_OFF Array DIM(MAC) of (LOG) - .true. indicates consciousness events
            disabled.  Checked by conevt, must be set/unset by RULES.
            Defaulted to .false. in extsdd.
 ssm_char_p  ARRAY DIM(MAC) OF (PTR) - Pointer to /ssm_char/.  Valid
            only if this is an surface-to-suface missile, i.e., if
            is_ssm(iac)=.true.
 ssm_trj_p   ARRAY DIM(MAC) OF (PTR) - Pointer to /ssm_trj/.  Valid
            only if this is an surface-to-suface missile, i.e., if
            is_ssm(iac)=.true.
 is_ssm     ARRAY DIM(MAC) OF (LOG) - .true. if this is a
            Surface-to-Surface Missile.
 SLOT_IN_USE ARRAY DIM(MAC) OF (LOG) - .true. if this slot is occupied
            by a valid entity.  This is required because slots may be
            cleared when running in a confederated mode.
 extst   ARRAY DIM(LEXTST) OF (INT) - dummy equivalence array for /extst/
 extstc  ARRAY DIM(LEXSTC) OF (INT) - dummy equivalence array for /extstc/
#SLOT/VARIABLE/DESCRIPTION          Equivalences for array _
#COMMENTS
   ***WARNING***: If new variables are added to /extst/, provision for
writing
   them to the history file must be made by modifying pk_extst_rec.
Don't
   forget to do this!
####
#AUDIT
C MODIFIED BY RMKerchner ON 15-Apr-94
C  Clarified definition of updmod
C PART-INCLUDE BY AAGordon,, ON 15-Nov-93 16:13:08 Mon FROM TASK
ead_synch
```
C MODIFIED BY AAGordon,, ON 12-Nov-93 16:30:07 Fri FOR TASK ead_synch
C Updated documentation for RBE matrix to clarify convention.
C MODIFIED BY GKEiserman ON 06-Jul-93 16:11:39 Tue FOR TASK ead_synch
C Add parameter confed_sim as a new value for updmod.
C PART-INCLUDE BY ELazarus ON 21-May-93 14:42:22 Fri FROM TASK bugfix8
C MODIFIED BY ELazarus ON 21-May-93 13:46:30 Fri FOR TASK bugfix8
C Previous mod should have modified EXTALV, EXTNAC, EXTFGG, and EXTFAB
C PART-INCLUDE BY MVKramer ON 10-May-93 13:13:18 Mon FROM TASK new_cd
C MODIFIED BY MVKramer ON 29-Apr-93 09:33:08 Thu FOR TASK new_cd
C Moved cdtbl to /acstat/.
C PART-INCLUDE BY Chinn ON 23-Jul-92 15:32:56 Thu FROM TASK wssc_int
C MODIFIED BY Chinn ON 23-Jul-92 13:24:22 Thu FOR TASK wssc_int
C Added UNSPEC parameter to denote unspecified process controlling A/C
C PART-INCLUDE BY Kramer ON 06-Jul-92 16:43:49 Mon FROM TASK scud
C MODIFIED BY Kramer ON 24-Jun-92 08:28:59 Wed FOR TASK scud, HF#653

C Added ssm_char_p, ssm_trj_p, is_ssm
C PART-INCLUDE BY Chinn ON 05-Feb-92 10:32:25 Wed FROM TASK sh_mem
C MODIFIED BY RMKerchner ON 21-Jan-92 15:54:51 Tue FOR TASK sh_mem
C Added dummy arrays extst, extstc
####

fcstat

```
#NAME     fcstat
#PURPOSE Hold local fire control related variables for a single a/c
#AUTHOR   BENT   02-DEC-1985
#CONSTANT DESCRIPTION
 LFCSTA   int - length of this block
 MAXAIR   int - length of LINAIR
#VARIABLE DESCRIPTION
 CFCPTR   ptr - pointer to this block
 FCSTA    array dim(lfcsta) of (real) - fire control status block
#VARIABLE/DESCRIPTION          Equivalences for array fcsta
    The following variables are associated with a missile that has
    been pickled but has not yet separated.
    LNCHNG LOG - true indicates a launching is in progress.  Is
           set by AKSHN7 and unset by MSLRLS
    LNCHNG_TGT ac-idx - If LNCHNG is .TRUE., this is the intended target
of
           that missile.  Needed for PRCNFB routine.  Could very well be
           different from TGTDES.  Set in AKSHN7 and reset in MSLRLS.
    LNCHFX INT - fox # of missile that is being launched.  Set in AKSHN7
           and never used!

    MSLPP INT  - Currently selected weapon.
           If between 1 and nummis this is a missile.
           If between nummis+1 and nummis+numgun this is a gun.
           nummis and numgun are parameters in /par/.
    TIMEMF REAL - time after which missile can be fired
    MINAIR INT  - Number of missiles currently in air, being supported
           with updates from this device.fired by this a/c.
    LNCHMD INT  - launch mode desired.  Pilot sets when when LNCHMA = 0
           and weapon/target pair has been selected (ppmjac>0). Until
we
           devise a more sophisticated algorithm, he will always set to
1.
           Note that LNCHMD and LNCHMA are associated with the
currently
           selected missile - if one has been pickled but not
separated,
           these variables are not associated with it.  Zeroed in
AKSHN7
    LNCHMA INT  - Actual launch mode when fire control constraints have
           been met for some launch mode for the currently selected
           missile.  Zeroed in AKSHN7
    TGTDES ac-idx - Avionics designated target.  Set to the target
           selected by SELWPN or to zero if no target selected by
SELWPN.
           Automatic TWS pattern positioning algorithm moves this
aircraft
           to the top of the list of priority targets on which to fit
TWS
           pattern.  The only higher priority targets are those under
missile
           attack which require illumination.
```

HD_SLV_ACT LOG - Obsolete

        The next two variables are used to communicate a successful
        or failed launch so that pilot can delete the failed missile
        from his mental model if necessary.
LNCHST INT - current launch status for the selected weapon (0=no
        request for launch, 1=launch request, 2=successful launch,
        3=launch abort.) Set to 1 in AKSHN7, to 2 or 3 in MSLRLS
        and back to zero in MSL2x0
LNMSID INT - Unique ID of missile, set by akshn7 and
        unset by msl2x0. Only valid from the time that the missile
        firing decision is made to the time that the pilot becomes
        aware of whether or not the launch was successful.

LINAIR ARRAY DIM(MAXAIR) OF (INT) - List of missiles in air being
        supported by updates from this fire control devices.
        Number on list is MINAIR.
LSLOT_SLCT INT - Slot in /MSLEXT/ occupied by currently selected
        missile. Zeroed when missile is pickled in akshn7.
SKR_CAGED ARRAY DIM(MXSKR) OF LOG - True if seeker is caged.
         Only relevant for lock on rail seekers prior to launch.
        Indexed on seeker type, not seeker number; i.e. reference
        as skr_caged(irskr). Note that although this variable
        is set in various locations, it is not currently used
        (20AUG94 - EL).
SKR_ACQUIRED ARRAY DIM(MXSKR) OF LOG - True if seeker has
        acquired. Only relevant for lock on rail seekers prior
        to launch. Same indexing as previous variable.
SKR_BORESITED ARRAY DIM(MXSKR) OF LOG - True if seeker is
        boresighted. Only relevant for lock on rail seekers prior
        to launch. Same indexing as previous variable.
####
#AUDIT
C PART-INCLUDE BY ELazarus ON 24-Aug-94 16:07:45 Wed FROM TASK for62
C MODIFIED BY ELazarus ON 22-Jul-94 15:32:08 Fri FOR TASK for62
C Add skr_caged, skr_acquired, skr_boresighted.
C MODIFIED BY ELazarus ON 05-Jul-94 10:02:16 Tue FOR TASK for62
C Added lslot_slct.
C MODIFIED BY ELazarus ON 01-Jul-94 18:25:16 Fri FOR TASK for62
C Added mslid_slct
####

mind2

```
#Purpose  Stores Value Elements For Each Pilot
#Author   Kerchner
#Type     Mental Model
#CONSTANT DESCRIPTION
 Lmind2    INT - Total Length Of Mind2 Common Block (For Mind Swaps)
 L_TNLVIS  INT - Number of tunnel vision variables
 SL_NUM    INT - Number of skill levels allowed.
 SL_LOW    INT - Integer parameter corresponding to a ROOKIE pilot
 SL_MED    INT - Integer parameter corresponding to a PILOT
 SL_HIGH   INT - Integer parameter corresponding to an ACE
 I_OVROFF  INT - Named parameter for overly offensive inherent bias
 I_NMUSUP  INT - Named parameter for attention to mutual support bias
 I_NOSPD   INT - Named parameter for attention to maintaining airspeed bias
!  following are possible values of gci_tactic:
 FOLLOW_GCI INT - as named in ALTERN file
 GCI_DRAG_TACTIC  INT - same
!  following are indexes for tmls_gci
 GC_MAX_TP INT - Max number of types of GCI messages
 GC_MNVR INT - GCI maneuver message
 GC_SPD INT - GCI speed message
 GC_TAC INT - GCI tactics message
 GC_TGT INT - GCI target message
 GC_VEC INT - GCI vector message
!  following are allowable values of id_mode:
 bvr_id_md  int - allowed to fire at unknowns
 electronic_id_md    int - can shoot with any ID method
 visual_id_md  int - can only shoot with visual ID (or message
            indicating status as a confirmed hostile)
!  following are allowable values of flt_tgt_ass_mode:
      ass_tgt_group - assignment can be a group of targets
      ass_tgt_single - assignment can be at most 1 target
#VARIABLE DESCRIPTION
 IFREND    ARRAY DIM(5) OF (INT) - See Equivalences Below.
 CACTN     ARRAY DIM(20,MLEVEL) OF (INT) - Defines current action at each
            decision level.  Each column is a copy of an /althld/althld
array.
 VALUES    ARRAY DIM(NVALS) OF (VARIOUS) - See Equivalences Below.
 TMDLEV    ARRAY DIM(MLEVEL) OF (REAL) - Time at which decision, at level
            denoted by index, was last reconsidered.
 LMDLEV    ARRAY DIM(MLEVEL) OF (LOG) - .True. if a decision at indexed
             level is desired.
 VALUE2    ARRAY DIM(NVALS) OF (VARIOUS) - An extension of values.
 TMLS_GCI ARRAY DIM(GC_MAX_TP) OF (REAL) - Time at which the last
            message of the given type was received.
 TNLVIS    ARRAY DIM(L_TNLVIS) of REAL - See Equivalences Below
 GCR_CORR_THR   REAL - [0,1] Correlation threshold of target with GCI
                target.  Higher value makes use of the GCI range values less
                likely.  Principal use of this variable is in gctgtv.
 GCR_RSIGMA_THR REAL - Fraction [0,1] that serves as threshold for bad
                range data.  (i.e. range sigma is greater than
                gcr_rsigma_thr*range); higer value makes use of GCI
                ranges by pilot less likely
```

```
MXTGT_AC ARRAY DIM(MAC) OF (AC-INDX) - The number of missiles to
         fire at each hostile (by tail number).  Default value is
         set by mxtgtd, can be changed in RULES.
 flt_tgt_ass_mode - int - indicates whether assignments of targets gives
         each flight member an individual target or a group of targets.
         Allowable modes enumerated above
 ass_ttg_threshold - real - seconds - indicates the time-to-go to
         engagement range threshhold outside of which the flight leader
will
         hold off target assignments to flight subordinates.
 ass_feba - log - .true. indicates willingness to assign targets that
         will be intercepted on the hostile side of the FEBA.  This
         controls biasing against such assignments, but does not
         absolutely forbid them.
 shoot_over_feba - log - if .true. crossing feba to shoot is legal.
 min_acq_qual - int one of /parsns/trk_qual_xxx.  The minimum track
quality
         acceptable for assigning a target.  See adjust_acq for useage.
 kill_over_feba - log - if .true. killing a target while he is on his
         side of feba is legal (use not implemented yet, put in
ps_x_feba)
```

#Slot/Variable/Description		Equivalences For Array IFREND
1	IACID	AC-IND - My aircraft index.
2	IFLITE	INT - My flight index.
3	IELEM	INT - My element Index.
4	MYJOB	INT - My job:
		1 = flight leader.
		2 = element leader (but not flight leader).
		3 = wingman.
5	MYGCI	AC-IND - Of GCI controller that can send vectors for me
		to follow; 0 if none

#SLOT/VARIABLE/DESCRIPTION		Equivalences for array CACTN
3,1	ALTD1	INT - the packed alternative descriptor for
		the currently selected tactics decision for this pilot.
3,2	ALTD2	INT - the descriptor for current pilot posture dec.
3,3	ALTD3	INT - the descriptor for current maneuver decision.
3,4	ALTD4	INT - the descriptor for current FltPosture dec.
3,7	ALTD7	INT - the descriptor for current Weapons decision.
5,4	FLTP	INT - current flight posture
6,4	NFLTP	INT - new flight posture
7,4	IGNGC4	LOG - if .true. then pilots should ignore GCI vectors.
5,1	ass_tgt_ptr2	PTR - to copy of /ass_tgt/. Valid only when order
		messages are being received

#SLOT/VARIABLE/DESCRIPTION		Equivalences for array VALUES
1	DXW0	3-VEC - Formation position. Offset from leader in level
		coordinate system with X-axis along leader's heading.
4	STKPN	REAL - Value multiplier for formation flying or mutual
		support.
5	VOBSRV	REAL - Value multiplier associated with nondirected
		observations of other aircraft.
6	OFFMLT	REAL - Overall scale multiplier for offensive value aspects.
7	DEFMLT	REAL - Overall scale multiplier for defensive value aspects.
8	TMUSUP	REAL - Scale time for penalizing interval since mutual
		supportee last seen.

```
 9  WTVMSLREAL - Weight (0-1) to sighting portion of mutual support.
10  SBMBR REAL - Desired speed for maintaining positions versus a
                 bomber formation--for escorts only.
11  RTPNT   3-VEC - Target point for routepoint following leg.
14  SPEEDM   REAL - Speed to use while on route.
15  VMISN    REAL - Value multiplier for routepoint.
16  TOAMSNREAL - Desired time of arrival at routepoint.
17  LTBMBRLOG - .true. when a long turn is required to get back to
                 support bombers.
18  MSNMLTREAL - Value multiplier for mission-related value aspects.
19  TRCHW REAL - Width (sec) of border region for reachability
                 portion of mutual support.
20  TRCH     REAL - Scale time for ability to reach mutual supportee.
21  AGGFACREAL - Aggressiveness factor.
22  TPROJ REAL - Time used for maneuver projections (sec).
23  HLVEC 3-VEC - High level direction vector.
26  HLVAL    REAL - Multiplier for vector-following.
27  HLSPD    REAL - Speed to use while vector-following.
28  CLIMBM REAL - Maximum rate of climb while making routepoint
                 altitude changes.
29  GMAXMREAL - Maximum g's to use during route following
                 maneuvers.
30  DEFSCLREAL - Estimate of value that can be achieved for
                 defensive aspect.
31  MGUN  LOG - .true. if gun is currently firing.
32  VALME REAL - Value of self.
33  OFFSCL   REAL - Estimate of value that can be achieved for
                 offensive aspects.
34  KCHAN    INT - Channel to use for communicating with flight.
35  T_GUN_EVAL  REAL - Time gun temperature last updated
36   Unused
37  TIMROT   REAL - Time flag-roll over the top.
38  VALROT   REAL - Roll over the top value.
39  Unused
40  ROLLIM LOG - .true. if roll limits will be applied at the
                 beginning of the next fly event.  rollim is currently
                 set but not used.  In the future it may be used by
                 the maneuver projection routines.  The actual limit may
                 be found in /mindpr/rolmax.
41  DISENG   LOG - Disengagement decision made by evdisi.
42  TDSENG   REAL - Time of disengagement.
43  XBASE    3-VEC - Location of home base.
46  RHAW     LOG – Radar homing and warning flag: .true. if being tracked.
47  VFUEL    REAL – Fuel value/slug over bingo.
48  VTIME    REAL – Time value/second.
49  SMBMBRREAL - Desvv parameter.
50  SWBMBRREAL - Used in scoring formation values.
51  ALOCFAREAL - Factor to knock down non-target values when ordered.
52  ALOCTMREAL - Order duration time constant.
53  TPROJ3REAL - Actual value for maneuver projections.
54  HKDRAG LOG - .true. if hook-drag flight tactic is in effect.
                 Defined in terms of CAS.
55  HDSPRD REAL - Criteria for selecting hookdrag tactic.  If pmax
                 and pmin are the max and min probabilities of loss for a/c in
```

```
          the flight, then pmax/pmin must be greater than hdsprd to pick
          hookdrag.  In other words, some of the flight must be in more
          trouble than others.  See subroutine alt152.
56   HDPKLO REAL - Minimum of maximum risks for hook-drag.
57   HDPKHI REAL - If maximum risk exceeds, always hook-drag.
58   HDRKMX REAL - Maximum loss-to-kill ratio on intermediate
          hook-drag case.
59   LOOPNF LOG - .true. if 360 degree loop is completed.
60   LOOPHA LOG - .true. if 360 degree loop half completed.
61   ICHANG LOG - .true. if mental model indexing has changed.
62   OCHANG LOG - .true. if orders have changed.
63   FIRDEL ARRAY DIM(3) OF (REAL) - Minimum delay between missile
          firings (by 'kind').
66   GUNDEL REAL - Minimum delay between gun bursts.
67   MXTGTD INT - Maximum weapons targeted on a single target.
68   MISN   INT - Mission type; 1=regular_routepoints
          2=escort
          3=CAPstation mission segment
69   TLSTCE   REAL - Time of last consciousness event.
70   OLDOP    PTR - Pointer to old orders.
71   OLDOTMREAL - Time at which old orders were given.
72   DESDIS   LOG - .true. if disengagement is desired.
73   MCHANGLOG - .true. if missile added to or deleted from mental
model.
74   TALLOC   REAL - Time at which mbrawl was last executed.
75   TTACTC   REAL - Time at which this tactic was implemented.
76   ALTD1O   REAL - altdesc of previous flight tactic.
77   SEPMLT   REAL - Importance multiplier for maintaining separation.
78   SEPLAE   REAL - Desired separation for aircraft in other elements.
79   SEPHTE   REAL - Unused.
80   SEPLAW REAL - Desired separation in my element.
81   SEPHTW REAL - Unused.
82   RPEAK    ARRAY DIM(4) OF (REAL) - Location of weapon envelope
          maximum expressed as a percentage of maximum range.
          Indexed like /misdat/kndmsl.
          1 => visual range missile (e.g. AIM9)
          2 => near BVR missile (e.g. AIM7)
          3 => medium range BVR missile (e.g. AMRAAM)
          4 => gun
86   ID_MODE  INT - hostile identification mode to enable firing.
          Allowablevaluesare:bvr_id_md,electronic_id_md,visual_id_md
87   HDTTYP   INT - Hook drag tactic type:
          1: dragger should turn towards friend
          2: dragger should turn away from friend
88   HDPSMN REAL - Do not hook-drag if the probability of detection
          for all members of flights is below this threshold.
89   SPLITA   REAL - Desired line-of-sight angle for use by split-type
          maneuvers.
90   VBMBR    3-VEC - Desired direction of travel to support bombers
          (unit vector).
93   BFLT     INT - flight number of bombers I am assigned to escort
          (0 if none).
94   BSTN     3-VEC - Desired offset, from the center of mass of the
          bomber formation, to escort bombers.  Defined in the c.m.
```

```
                    horizontal coordinate system.
  97  ESCMLTREAL - Importance multiplier for escorting bombers.
  98  DISHIB   LOG - .true. if disengagement values are inhibited.
  99  LDFORMAC-IND - tail number of this pilot's leader (for
                  purposes of flying formation on someone).  If flight
                  leader, ldform=iacid.
 100  PRDONE LOG - Flag indicating that special flight tactics
                  production rule code was properly executed.
#SLOT/VARIABLE/DESCRIPTION             Equivalences for array VALUE2
   1  PR2LIM   REAL - lower limit on probability that Range to a target
                  is within Rmax2 -- the maximum range for the current weapon;
                  this lower limit is used to assess whether the weapon can at
                  this time be fired; see Function PRMAX2, which is called from
                  routine SELWPN.  Used mostly under ECM conditions currently.
   2  DIRSPC   INT - indicates type of direct maneuver specification:
                  0 => no specification
                  1 => specification by production rules
                  2 => specification by interative pilot system
   3  DIRVAL   REAL - direct and vectored maneuvers importance multiplier.
   4  DIRALT   ARRAY DIM(5) OF (VARIOUS) - Copy of althld(5..9).
                  Needed by the system to construct the direct
                  maneuver (iactn=3).
   9  CONEV1   LOG - indicates that this is the first CONsciousness
                  Event for this a/c.
  10  LAST_NEAR_TIME  REAL - Last time nearby list is updated
  11  DIRTIM   REAL - time until which the current direct maneuver
                  is to be effective; undefined if dirspc=0.
  12  PBRNGD   REAL - User input (in degrees) for a flight.
                  Cauchy width used in gctgtv; it determines how important
                  target bearing accuracy is when deciding how "close" known
                  targets are to those the pilot is being vectored toward.
                  Those more important receive higher valord values.
  13  PRNGD    REAL - User input (in nmi) for a flight.
                  Cauchy width used in gctgtv; it determines how important
                  target range accuracy is when deciding how "close" known
                  targets are to those the pilot is being vectored toward.
                  Those more important receive higher valord values.
  14  PHDGDF   REAL - User input (in degrees) for a flight.
                  Cauchy width used in gctgtv; it determines how important
                  tgt heading accuracy is when deciding how "close" known
                  targets are to those the pilot is being vectored toward.
                  Those more important receive higher valord values.
                  Target heading is the targets' heading.  Target bearing
                  refers to the angle of the line of sight.
  15  GCNETK   REAL - Value sent by GCI associated with GCI vectoring
                  that allows pilot to pick a flight posture other than
                  mission - it weights bvr_attack_posture.  It is called
                GCNETK because it is similar to AEVAL4's NetKil factor.
                  It is currently only applied when nbg==0 (see aeval4).
  16  GCVCRS   REAL - a heading (rad) sent by GCI; this is the course
                  he desires this pilot to follow.
  17  GCVALT   REAL - desired Altitude (ft.) sent by GCI; see GCVCRS
  18  GCVRNG   REAL - target Range (ft.) sent by GCI; see GCVCRS
  19  GCVSPD   REAL - target Speed (ft/sec) sent by GCI; see GCVCRS
```

20 GCVHDG   REAL - target Heading (deg) sent by GCI; see GCVCRS
21 IPRMOD   INT - mode flag indicating whether IP wants control
              over the mode/target of his radar:
              0=no control over SELRDR decision
              1=insist on full scan
              2=STT on target IPRTGT
              3=TWS if available else full scan
22 IPRDIR   LOG - true if IP wants control of radar az/el.
23 IPRSIZ   LOG - true if IP wants control of azwidth/nbars.
24 IPRSTO   LOG - true if IP defaults for azwidth/nbars are stored.
25 IPRTGT   AC-IND - radar target when in single target track.
26 IPRAZ   REAL - azimuth desired by IP when IPRDIR.
27 IPREL   REAL - elevation desired by IP when IPRDIR.
28 IPRAZW   REAL - azwidth desired by IP when IPRSIZ.
29 IPRZWD   REAL - default value for azwidth when no IP control again.
30 IPRBAR   INT - number bars desired by IP when IPRSIZ.
31 IPRBRD   INT - default value for nbars when no IP control again.
32 VFSPC   INT - analogous to dirspc, for the specification of a
              vectored flight maneuver:
              0 = no vector or specified by flight tactics routines
              1 = specification by production rules
              2 = specification by IP system
33 VFTIM   REAL - analogous to dirtim, time until which the current
              vectored flight ;maneuver is to be effective; undefined if
              vfspc /= 2.
34 L1OPP   LOG - indicates only one significant close-in opponent;
              Used to trigger special 1v1 maneuvering logic.
35 BVRMCH REAL - desired mach for certain BVR maneuvers and tactics.
36 V1V1   3-VEC - specified 1v1 direction, as designated by 1v1 subr.
39 SPD1V1   REAL - specified 1v1 speed, as designated by 1v1 subr.
40 SLOSPD   REAL - speed to begin considering low speed covery.
              Defined in terms of CAS.
41 DTUDES REAL - time interval within which a visual detection
                 is required for an undesignated launch of an active
                 radar missile.
42 FMPTR INT - pointer to the /FMEXT/ in memory.
43 TGT1V1 INT - ac-ind of aircraft that the attacker is
              1v1 against.
44 RHAWONLOG - .TRUE. if aircraft has a functioning RHAW.
45 IENT   INT - indicates entity type:
              1 => aircraft
              2 => gci entity
          3 => samsite
          4 => back track entity
46 LLVDIS   LOG - .true. indicates a/c in disengage phase of the
              launch_and_leave tactic.
47 DISBNG   LOG - .true. if disengagement is required because the
              bingo fuel limit is being approached.
48 FCTPTR   array dim(3) of (ptr) - Pointers to block memory for the
              flight level fire control constraints; one each for
              weapon selection, weapon enable, and weapon firing.
              The data structure stored in block memory is a copy
              /bestrc/.
51 GCV_TIMEREAL - Time associated with gcvalt, gcvrng, gcvspd,

```
                    and gcvhdg.
52  TMLAFR  REAL - TiMe LAst FiRed: time a shot last taken, used by
                    aslct7 for ripple fire delays; set by akshn7.
53  PCAPLG  PTR - Pointer (ListMem) to an instance of /caprt/
                    which gives the CAP legs for the pilot.
54  CAPLEG  INT - Index to what CAP leg the pilot is currently on.
55  SLOGEE  REAL - G at or below which the pilot decides he is in a
                    slow-flight regime.  See getslo (called by aeval3i).
56  BARALTARRAY DIM(5) OF (VARIOUS) - Copy of althld(5...9).
                    Needed to construct the barrel roll maneuver
61  SLCTR   ARRAY (FOX-NUM) OF (REAL) - weapon select Rng limits in NMI
                    a fox-number index runs from 1..nummis + 1 meaning msl-1,
                    msl-2, ... , msl-nummis, gun.
68  FIRLIM  ARRAY (FOX-NUM) OF (REAL) - wpn Firing limits in NMI.
                    (to enter missile-mode = 2)
                    For setting of vars SCNLIM,SCNLM3,SLCTR,FIRLIM, see Subr SCNLMI
75  TAUGCI  REAL - Decay constant for pilot evaluation of GCI vectors.
                    Typical values are 10.-60. sec.
76  VALGCI  REAL - Importance of GCI vectoring to pilot weapon/target
                    selection.  Values should be positive numbers or zero.
                    Typical values are 1.-5.
77  ORDTIM  REAL - Time at which orders last received.
78  CAPGS   REAL - NUMBER OF GEES FOR TURN PHASES OF CAP
79  GCVBRG  REAL - Target group's bearing (given as the heading that
                    points from friendlies to hostiles; it is NOT a relative
                    bearing because the controller wouldn't use a relative
                    bearing anyway if he didn't know with high accuracy the
                    body axis (velocity vector) of the friendlies
80  SLEVEL  INT - Pilot experience level (sllow=rookie, slmed=pilot,
                    and slhigh=ace)
81  MXACMM  INT - Maximum number of aircraft (including himself) to
                    be considered in each pilot's mental model as a function
                    of skill level and situation awareness
82  BIAS_FAULTS ARRAY DIM(MFALTS) of REAL - List of inherent biases
                    for each aircraft.  These biases act as multipliers on
                    the manuever value components found in /valhst/.
                    If no bias given, default vlaue
                    is 1.0.  Currently, there are three biases which are
                    identified by the named parameters above:
                    OVERLY OFFENSIVE  > 1 increases VOFFEF and VMAIM
                    MUTUAL SUPPORT  > 1 increases VMUSUP and SEPVAL
                    AIRSPEED  > 1 increases GAVAL and VLOSPD
88  GUN_TEMP REAL - Fraction of maximum gun temperature reached.  Used
                    in canfir to determine if gun is cool enough to fire.
89  GC_MSG_TP INT - Identifies message type of GCI vectoring message.
                    Possible values are as defined in /comdir/:
                    COMGCI   INT - 8, GCI Vectoring message.
                    COM_GCI_MNVR INT - 13, Maneuver vectoring information
                    COM_GCI_SPD INT - 14, Change of speed instruction from GCI
                    COM_GCI_TGT INT - 15, Targeting information passed from GCI
90  GCV_SPDDES REAL - desired speed (ft/sec) sent by GCI
91  GCV_GEESDES REAL - desired G's to pull in turn, sent by GCI
92  GCV_ROCDES REAL - desired rate of climb sent by GCI
93  TACTIC_PHASE INT - current tactic phase
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 94 GCI_TACTIC  INT - type of GCI tactic requested by GCI controller
               Possible values are:
               0 => none
               follow_gci
               gci_drag_tactic
 95 GTAC_MSG_PT - Pointer to saved contents of GCI drag tactics mesg
                   to be retrieved when additional mesg info comes
                   through
 96 GCV_NOLNCH LOG - .TRUE. indicates that launches should be
                     inhibited
 97 SL_G_LEEWAY REAL - Leeway gees used in determining if in a
                         slow-flight regime (Used in getslo)
 98 ORD_FACT REAL - Variable order factor
 99 NOAMMO_SENT LOG - .TRUE. indicates that pilot has sent an
                       out-of-ammo message to his GCI controller
100 GCVTAL real - Expected target altitude as received in GCI
               vectoring message.
! slots 85-87 are reserved in case mfalts grows (see bias_faults) !
#SLOT/VARIABLE/DESCRIPTION           Equivalences for array TNLVIS
    1 TNL_VIS     LOG - Tunnel vision control flag.  .true. indicates
                        that the pilot is in an induced goal fixated state.
    2 TNL_ALPHA   REAL - Tunnel vision constant used to compute tunnel
                        vision multipliers for each value component
    3 TNL_BETA   REAL - Tunnel vision constant used to compute tunnel
                        vision multipliers for each value component.  This is
                        set as a function of pilot skill level.
    4 TNL_TAUREAL - Tunnel vision time constant used to determine
                        when to reset the tunnel vision multipliers back to 1.
                        This is set as a function of pilot skill level.
    5 TNL_CNTRST  REAL - Tunnel vision contrast exponent on variances.
    6 TNL_MULT    ARRAY DIM(NVALCP) of REAL - Tunnel vision multiplers
                        for each maneuver value component.
####
#AUDIT
C MODIFIED BY RMKerchner ON 08-Apr-94  13:22:04 Fri FOR TASK hrl_sharemm
C  Added flags min_acq_qual, shoot_over_feba, kill_over_feba
C MODIFIED BY RMKerchner ON 07-Apr-94  15:23:39 Thu FOR TASK hrl_sharemm
C  Added ass_feba flag, which indicates willingness to assign targets
C  who will be intercepted on the hostile side of the feba
C MODIFIED BY AAGordon,, ON 24-Mar-94  16:01:18 Thu FOR TASK hrl_sharemm
C  Added ass_ttg_threshold which is the time-to-go threshold beyond
C  which target assignments from the flight leader will not be made.
C MODIFIED BY RMKerchner ON 07-Mar-94  13:17:22 Mon FOR TASK hrl_sharemm
C  Added flt_tgt_ass_mode
C MODIFIED BY RMKerchner ON 07-Feb-94  14:37:07 Mon FOR TASK hrl_sharemm
C  Added ass_tgt_ptr2, equivalenced to cactn(5,1)
C PART-INCLUDE BY DPCroghan ON 17-May-93 08:44:59 Mon FROM TASK rwr_upd
C MODIFIED BY DPCroghan ON 14-May-93  07:16:58 Fri FOR TASK rwr_upd
C  Added array mxtgt_ac, which replaces the use of mxtgtd.  Mxtgtd
C is still read in and used to initialize the mxtgt_ac array.  The
C array allows the user to set which targets will get a different
C number of missiles than the default, which is mxtgtd.
C PART-INCLUDE BY Kramer ON 26-Oct-92 15:38:35 Mon FROM TASK bugfix8
C MODIFIED BY Lazarus ON 26-Oct-92  15:25:06 Mon FOR TASK bugfix3
```

```
C  Moving task wssc_fc from devel to new_distrib - removed variable
C  LASTGT.
C PART-INCLUDE BY Kramer ON 26-Oct-92 12:38:38 Mon FROM TASK bugfix9
C MODIFIED BY Kramer ON 22-Oct-92  15:56:26 Thu FOR TASK bugfix9
C  Removed gci_rng_obs_p and substituted gcv_time.
C  Added gcr_corr_thr, and gcr_rsigma_thr.
C PART-INCLUDE BY Chinn ON 10-Aug-92 11:42:10 Mon FROM TASK wssc_int
C MODIFIED BY Chinn ON 09-Aug-92  13:32:38 Sun FOR TASK wssc_int
C  Moved changes form devel to new_distrib
C PART-INCLUDE BY Chinn ON 07-Aug-92 13:29:30 Fri FROM TASK wssc_int
C MODIFIED BY Chinn ON 31-Jul-92  15:52:34 Fri FOR TASK wssc_int
C  Added last_near_time to value2 array
C PART-INCLUDE BY Croghan ON 22-May-92 08:44:32 Fri FROM TASK target_ID
C MODIFIED BY Croghan ON 21-May-92  15:06:38 Thu FOR TASK target_ID
C Moved changes to new_distrib
C PART-INCLUDE BY Croghan ON 21-Apr-92 08:27:30 Tue FROM TASK target_ID
C MODIFIED BY RMKerchner ON 02-Apr-92  15:17:16 Thu FOR TASK intcpt_degr
C  Replaced lvisid with id_mode.  Added related parameters bvr_id_md,
C  visual_id_md, electronic_id_md
####
```

mind3

```
#NAME      MIND3
#PURPOSE   Stored perception of aircraft in mental model
#AUTHOR    Kerchner
#CONSTANT DESCRIPTION
 LMIND3    INT - Length of the common block /MIND3/
 ME        INT - Index of self in mental model. (1)
#VARIABLE DESCRIPTION
 NSPOTD    INT - Number of aircraft in the detailed consideration group.
           This will be equal to the smaller of /mind2/mxacmm and
n_mm_est,
           below.
 NINMM     INT - Number of aircraft in the pilot's mental model.
           This is always the total number of aircraft that are in
           the pilot's mental model.
 N_MM_EST  INT - Number of established tracks in the pilot's mental
           model.  These are the tracks which are eligible for
           inclusion in the pilot's detailed consideration group.
           See mm_est_sta, mm_est_val, below.
 IACIDX    ARRAY (MM-IDX) OF (AC-IND) - Array of detected aircraft's
           assessed ID's.  Identical to iacidt.
 ITYPX     ARRAY (MM-IDX) OF (PTR) - Type of detected aircraft (typdat
           pointer).
 IREL      ARRAY (MM-IDX) OF (INT) - Relationship of aircraft:
           = rel_unknown        = 0 if unknown
           = rel_leader         = 1 if leader
           = rel_my_element     = 2 if member of my element
           = rel_other_element  = 3 if member of other element in my
flight
           = rel_other_friend   = 4 if other friendly
           = rel_hostile        = 5 if hostile, not engaged with self
           = rel_hostile_engaged = 6 if hostile engaged with self
 INFORM    ARRAY (MM-IDX) OF (INT) - See /SENSED/ documentation for
           variable JNFORM.
 OBSTIM    ARRAY (MM-IDX) OF (REAL) - Time of last "physical" observation.
           In particular, IFF detections, which only observe "type", do
not
           update obstim.
 FSTSEE    ARRAY (MM-IDX) OF (REAL) - Time first visually observed.
 XP        ARRAY (MM-IDX) OF (3-VEC) - Best estimate of position.
 VPOLD     ARRAY (MM-IDX) OF (3-VEC) - Time-lagged velocity.
 FSTOBS    ARRAY (MM-IDX) OF (REAL) - Time first observed.
 VP        ARRAY (MM-IDX) OF (3-VEC) - Best estimate of velocity.
 IAFTX     ARRAY (MM-IDX) OF (INT) - Afterburner flag:
           = 0 if unknown
           = 1 if afterburner is off
           = 2 if afterburner is on
 ISTORE    ARRAY DIM(/par/NMDROP,MM-IDX) OF (PTR) - Stores data pointers.
 JSTORE    ARRAY (MM-IDX) OF (INT) - Stores identification flag.
 VALEFF    ARRAY (MM-IDX) OF (REAL) - Last computed value for engaging
           each aircraft.
 LCNSDR    ARRAY (MM-IDX) OF (LOG) - Obsolete.
 IACIDT    ARRAY (MM-IDX) OF (AC-IND) - Actual aircraft ID.
```

```
            Identical to IACIDX.
 SVTIMX    ARRAY (MM-IDX) OF (REAL) - Mental model state vector time.
 AP        ARRAY (MM-IDX) OF (3-VEC) - Best estimate of position.
 SPDNOW    ARRAY (MM-IDX) OF (REAL) - Current speed.
 OBAOLD    ARRAY DIM(MM-IDX,MM-IDX) OF (REAL) - Time-lagged off-bore
angles.
 MMINDX    ARRAY (AC-IDX) OF (MM-IDX) - Cross reference array.  0 => not
            in mental model.
 MMINDT    ARRAY (AC-IDX) OF (MM-IDX) - Identical to MMINDX
 IFLTX     ARRAY (MM-IDX) OF (INT) - Each aircraft's flight.
 RADART    ARRAY (MM-IDX) OF (REAL) - Time last viewed on radar.
 SEET      ARRAY (MM-IDX) OF (REAL) - Time last seen visually.
 LREQAC    ARRAY (MM-IDX) OF (LOG) - .true. if an update request has been
            received but not responded to.
 RCVMT     ARRAY (MM-IDX) OF (REAL) - Last time a message received
            from aircraft.
 IELMX     ARRAY (MM-IDX) OF (INT) - Aircraft's element.
 DUMND2    ARRAY (MACMND) OF (INT) - Dummy variable.
 IFFTIM    ARRAY (IFFDEV,MM-IDX) OF (REAL) - Time the pilot last tried
            an IFF interrogation of this target, using this device.  The
            interrogation could have failed (no observation).
 RBEP      ORIENT - Earth to body orientation matrix for pilot.
 RWEP      ORIENT - Earth to wind orientation matrix for pilot.
 FMACHP    REAL - Mach of conscious pilot.
 ALPHAP    REAL - Angle of attack of conscious pilot.
 ASMTIM    ARRAY (MM-IDX) OF (REAL) - Time last assessed as owner of a
            missile.  negative if never assessed as owner of a missile.
 type_quality  array(mm-idx) of int - Measure of the quality of the
            typing information, with respect to usability for each of the
            /mind2/id_mode's.  Thus, a value of bvr_id_md indicates
adequate
            for bvr_id_md; a value of electronic_id_md indicates adequate
            for either bvr_id_md or electronic_id_md; a value of
            visual_id_md indicates quality adequate for any id_mode.
 MM_EST_STA  ARRAY (MM_IDX) OF (INT) - Mental Model track ESTablishment
              Status.  Equals one of the values in /mindc/:
              mm_tk_est       =>  Track is established.
              mm_tk_disest   =>  Track was established, but now has been
disestablished.
              mm_tk_nvrest  =>  Track has never been established.
 MM_EST_VAL  ARRAY (MM_IDX) OF (REAL) - Mental Model track ESTablishment
              Value.  If mm_est_val > /mindc/mm_est_lvl, the track will be
              established.  mm_est_lvl is read in from the MIND file.
              MIND also contains mm_disest_lvl and mm_purge_lvl, to be
             used at a future time for disestablishing and purging tracks.
              Currently, tracks are never disestablished and are purged
              after 300 seconds.
#SLOT/VARIABLE/DESCRIPTION          Equivalences for array _
####     Kerchner - FOR TASK IFF
#AUDIT
C PART-INCLUDE BY DPCroghan ON 30-Aug-94 17:00:54 Tue FROM TASK test
C MODIFIED BY DPCroghan ON 30-Aug-94  16:53:14 Tue FOR TASK test
C Swapped indexes on ifftim.
C PART-INCLUDE BY DPCroghan ON 26-Aug-94 13:33:41 Fri FROM TASK bugfix5
```

```
C MODIFIED BY DPCroghan ON 25-Aug-94  11:28:07 Thu FOR TASK bugfix5
C  made ifftim indexed by (mm_indx,iffdev).  Increased the length of
C lmind3.
C PART-INCLUDE BY AAGordon,, ON 24-Nov-93 12:21:15 Wed FROM TASK
ead_synch
C MODIFIED BY AAGordon,, ON 24-Nov-93  08:44:31 Wed FOR TASK ead_synch
C  parameterized the irel contents - note that parameters aren't
C  referenced every where - most places still use hardcoded values.
C PART-INCLUDE BY RMKerchner ON 29-May-93 10:35:41 Sat FROM TASK bugfix8
C MODIFIED BY GKEiserman ON 24-May-93  11:35:53 Mon FOR TASK bugfix8
C  Added new variables n_mm_estab, mm_est_sta, mm_est_val, incremented
C  length.
C PART-INCLUDE BY Croghan ON 21-Apr-92 08:27:33 Tue FROM TASK target_ID
C MODIFIED BY RMKerchner ON 03-Apr-92  08:32:19 Fri FOR TASK target_ID
C  Added type_quality.  Increased length parameter lmind3.
####
```

mind4

```
#NAME      MIND4
#PURPOSE   Stores situational variables for mental models
#AUTHOR    BENT
#CONSTANT DESCRIPTION
 LMIND4    INT - Length of the common block /MIND4/
#VARIABLE DESCRIPTION
 TMAJUD    REAL - Time at which a major update was last performed
 NHUTIL    INT - Number of aircraft on the high-utility list
 LMAJUD    LOG - .true. if a major update is needed
 VALINT    ARRAY (MM-IDX) OF (REAL) - Intrinsic values of aircraft
 VALORD    ARRAY (MM-IDX) OF (REAL) - Order value of aircraft
 TAUORD    ARRAY (MM-IDX) OF (REAL) - Time constant associated with order
value
 TIMORD    ARRAY (MM-IDX) OF (REAL) - Time at which order was given
 UENG      ARRAY (MM-IDX) OF (REAL) - Engagement utility of aircraft, if
friendly
 VALSIT    ARRAY (MM-IDX) OF (REAL) - Situational value of aircraft
 LHUTIL    ARRAY DIM(MACMND) OF (MM-IND) - List of aircraft on high utility
list
 SEM2      ARRAY (MM-IDX,MM-IDX) OF (REAL) - Self-engagement measures.
              Index + 1 for self.  Left index is attacker, right index is
              target. Range is (0-1)
 NGG       INT - Number of "good guys"
 NBG       INT - Number of "bad guys"
 PATK      ARRAY (MM-IDX,MM-IDX) OF (REAL) - Probability i will attack j
 PKIL      ARRAY (MM-IDX,MM-IDX) OF (REAL) - Probability i will kill j
 VKEXP     ARRAY (MM-IDX) OF (REAL) - Expected value aircraft will destroy
 PSRV      ARRAY (MM-IDX) OF (REAL) - Probability aircraft will survive,
              not counting me killing him
 PSRVFL    ARRAY (MM-IDX) OF (REAL) - Probability aircraft will survive
 VALEFL    ARRAY (MM-IDX) OF (REAL) - Effective value for flight leader
              decision use
 NUATK     INT - Number of aircraft on target list LUATK
 UATK      ARRAY (MM-IDX) OF (REAL) - Utility of attacking each aircraft
 LUATK     ARRAY DIM(MACMND) OF (MM-IND) - List of good targets
 NUEVD     INT - Number on list LUEVD
 UEVD      ARRAY (MM-IDX) OF (REAL) - Utility of evading each aircraft
 LUEVD     ARRAY DIM(MACMND) OF (MM-IND) - List of threats
 COMBEF    ARRAY (MM-IDX) OF (REAL) - Relative combat effectiveness
 FRATIO    REAL - Effective hostile-to-friendly force ratio
 LISTF     ARRAY DIM(MACMND) OF (MM-IND) - List of mental model indices of
              friendlies
 LISTH     ARRAY DIM(MACMND) OF (MM-IND) - List of mental model indices of
              hostiles
 PSEEN     ARRAY (MM-IDX) OF (REAL) - Probability a friendly aircraft has
              been detected
 TSEEN     REAL - Time at which PSEEN was last updated
 RHST      REAL - Minimum range to a hostile aircraft
 RHSTM     REAL - Minimum range to a hostile missile
 PDETFL    REAL - Probability flight is detected
 NMYFLT    INT - Number of aircraft in my flight
 LMYFLT    ARRAY DIM(MACFLT) OF (MM-IND) - List of aircraft in my flight.
```

```
            I am the first on the list
 NMYELM    INT - Number of aircraft in my element
 LMYELM    ARRAY DIM(MACELM) OF (MM-IND) - List of aircraft in my element.
            I am the first on the list
 NMHUTL    ARRAY (MM-IDX) OF (INT) - Number of missile threatening each
             aircraft
 NMCEL     INT - Number of maneuver cells
 NAMCEL    ARRAY DIM(MHOST) OF (INT) - Number of aircraft in each
             maneuver cell
 MCELID    ARRAY DIM(MACMND) OF (INT) - Maneuver cell of each hostile
aircraft
 MCELLD    ARRAY DIM(MHOST) OF (MM-IND) - 'Leader' of each maneuver cell
 ACTTGT    ARRAY DIM(MACMND) OF (ac-idx) - Not implemented.  Intended as
            the actual target of indexed a/c.  Will presumably be passed
via radio
            message.
 LIRHAS    ARRAY (MM-IND) of (LOG) - INDEXED A/C, IN PILOT'S OPINION
            IS EQUIPPED WITH IR MISSLES
 TINIR     ARRAY (MM-IND) of (REAL) - TIME LAST IN IR ENVELOPE OF
            INDEXED HOSTILE
#SLOT/VARIABLE/DESCRIPTION          Equivalences for array _
####
#AUDIT
C PART-INCLUDE BY Eiserman ON 02-Oct-89 09:21:38 Mon FROM TASK
small_mind
C MODIFIED BY Kerchner ON 03-Sep-89 12:59:47 Sun FOR TASK small_mind
C  Made array valint dimensioned by mac again.
C PART-INCLUDE BY Bickley ON 21-Jun-89 11:07:09 Wed FROM TASK small_mind
C MODIFIED BY BICKLEY ON 20-Jun-89 11:03:41 Tue FOR TASK small_mind
C  Redimensioning all arrays from MAC to MACMND
C MODIFIED BY FARRIS ON 18-Jun-87 11:04:19 Thu FOR TASK canards
####
```

misdat

```
#NAME      MISDAT
#PURPOSE   missile data description
#AUTHOR    Lazarus
#COMMENTS
#CONSTANT DESCRIPTION
 lnmsl  INT - length of /misdat/
 nazbn          INT - Maximum number of azimuth bins for MRCS
 nelbn          INT - Maximum number of elevation bins for MRCS
 mbin           INT - Size of MRCS.
#VARIABLE DESCRIPTION - /misdat/
 misdat_cptr    PTR - Currency pointer
 fixdat         ARRAY DIM(LNMSL) OF (REAL) - fixed missile characteristics data
 mskmsl         INT - Bit pattern signifying special missile
                characteristics.  Parameters which define bits are in
                /par/bitstt,bitsal,bitbls,bitacc,bitgui,btwsil,bitspm,bittau,
                bit_ps.
 kndaro         INT - Type of aerodynamics specification to follow in
                the aerodynamics section.  Equals one of the values found
                in /par/
 kndfuz         INT - Type of fuzing algorithm for this missile.
                Equals one of the values found in /par/
 kndenv         INT - Type of envelope algorithm for this missile.
                Equals one of the values found in /par/
 kndmsl         REAL - Generic kind of missile.  Only denotes range for
                pilot planning purposes.  Valid values are:
                    1 => Visual range (e.g. AIM-9)
                    2 => Near BVR range (e.g. AIM-7)
                    3 => Medium BVR range (e.g. AMRAAM)
                    4 => Gun (not relevant here, but reserved (see ppmknd usage)
 mismas         REAL - Mass of missile at launch in slugs.  Note that this is
                redundant with WATE0 in the aerodynamics section.  The
                redundancy is historical.
 tdly           REAL - Time delay between firing and launch
 pl             REAL - Probability of successful launch, given firing.
 num_engine     INT - Number of engines on the missile
 skanxs         REAL - Missile seeker antenna RCS from head on. Units
                are square meters on input and are converted to square
                feet internally.
 comg_capable   LOG - Equals .true. if the missile can be launched
                command guided
 skr_tkb_alg    INT - Seeker-trackbank connection algorithm.  Specifies
                the algorithm for connecting seekers to trackbanks.
                Equals one of the values defined in /msl_par/
 skr_seq_alg    INT - Seeker sequence algorithm.  Specifies the order in
                which multiple seekers turn on and off during missile
                flyout.  Equals one of the values defined in /msl_par/
 skr_sequence ARRAY DIM(MX_SKRS,MX_SKR_STG) OF (INT) - List of missile
seekers
                in the order in which they turn on during missile flyout.
                Each column of this array corresponds to a single stage
                in the sequence and contains a list of all seekers which
                may be on during that stage.  Single seeker missiles and
```

	missiles which do not turn seekers on sequentially will only have a single stage. NOT USER INPUT, FILLED BY THE MISSILE INITIALIZATION CODE
n_skr_seq	INT - Number of seeker-sequence-stages. Equals 1 for single seeker missiles. For multi-seeker missiles, this is the number of steps defined in the seeker sequence algorithm. NOT USER INPUT, FILLED BY THE MISSILE INITIALIZATION CODE
gui_law_seq	INT - Guidance law sequence. Specifies the algorithm used by the missile to select different guidance laws at different points during the missile flyout Equals one of the values defined in /msl_par/
gui_in_alg	INT - Guidance Input Algorithm. Specifies the algorithm used by the missile to select from among its different trackbanks. Equals one of the values defined in /msl_par/
misaln	REAL - Missile/ launcher misalignment (in degrees) **NOTE: THIS DATA IS NOT CONVERTED TO RAD FOR INTERNAL STORAGE**
gydrft	REAL - IRU gyro drift (degrees per hour) **NOTE: THIS DATA IS NOT CONVERTED TO RAD FOR INTERNAL STORAGE**
disest_tim	REAL - If missile track not updated in this interval, it is disestablished
purge_tim	REAL - If missile track not updated in this interval, it is purged. purge_tim should be >= disest_tim.

```
!
! The following three variables replace cdmisl
!
```

num_m_acd_m	INT - Number of Machs and Cds specified in arrays msl_acd_mach and msl_acd.
msl_acd_mach	ARRAY DIM(MAX_CD_MACH) OF (REAL) - Machs that correspond to the CDs in array msl_acd.
msl_acd	ARRAY DIM(MAX_CD_MACH) OF (REAL) - Additive drag table for the missile.
naz	INT - Number of azimuth values (rows) of MRCS array. Also the used length of AZPTS (1 <= naz <= nazbn).
nel	INT - Number of elevation values (columns) of MRCS array. Also the used length of ELPTS (1 <= nel <= nelbn).
azpts	ARRAY DIM(nazbn) OF (REAL) - Bin values for MRCS azimuth; must be monotonically INCREASING. Input in degrees and converted internally to radians. The actual number of bins read on input is given by naz.
elpts	ARRAY DIM(nelbn) OF (REAL) - Bin values for MRCS elevation; must be monotonically INCREASING. Input in degrees and converted internally to radians. The actual number of bins read on input is given by nel.
mrcs	ARRAY DIM(MVBIN) OF (REAL) - Radar cross section of missile in square meters. The number of cross section values read on input is given by the product of naz and nel. The first naz words give the RCS at azimuths AZPTS(1) through AZPTS(naz) and ELPTS(1). The next naz words give the RCS for each azimuth at ELPTS(2) and so on. Internally this is stored as a packed two-dimensional array. Most uses of MRCS are

in a call to a subroutine which declares the corresponding
argument to be two-dimensional for convenience:
(naz,nel). This array is input in units of M**2 and
converted internally to ln(ft**2). The natural log of
RCS is stored to allow "geometric" interpolation by the
xsect subroutine.

```
!
! The remaining variables are not input in the FIXD section.
! They are filled during initialization using variables read from other
! sections.
!
 aptr          PTR - Pointer to aerodynamic data.  This element is
               filled in during program initialization.
 num_guid      INT - Number of guidance algorithms used by this missile.
 guid_dat_ptr  ARRAY DIM(NUM_GUID) OF (PTR) - Pointer to guidance data
               (/guidat/).  Filled in during intialization.  Get routine
               is get_guidat.  Put routine is put_guidat.
 guid_type     ARRAY DIM(NUM_GUID) OF (INT) - Array of guidance algorithm
               types.  Each element equals one of the values found in
               /par/.  Indexed same as guid_dat_ptr.
 fptr          PTR - Pointer to fuzing data.  Filled in during
               initialization.
 num_seekers   INT - Number of seekers on this missile.  Note that a
               seeker that can operate in two distinct modes (i.e.
               semi-active and active) will count as two seekers because
               it requires two separate blocks of data.
 skr_dat_ptr   ARRAY DIM(NUM_SEEKERS) OF (PTR) - Pointer to seeker data
               (/skrdat/).  Filled in during intialization.  Get routine
               is get_skrdat, put routine is put_skrdat.
 skr_type      ARRAY DIM(NUM_SEEKERS) OF (INT) - Array of seeker types.
               Each element equals one of the values found in /par/.
               Indexed same as skr_dat_ptr.
 eptr          PTR - Pointer to envelope data.  This element is
               filled in during program initialization.
 mtyptr        PTR - Pointer to character data. Filled in during
               initialization.
 knd_irsig     INT - Kind of IR signature data.  Must be one of the
               types defined by a parameter in /msl_par/.
 irsig_ptr     PTR - Pointer to IR signature data /msl_irsig/.  This
               element is filled in during program initialization.
#VARIABLE DESCRIPTION - /misdtc/
 mistyp        CHAR - Missile name (as read from the STORED file).
#SLOT/VARIABLE/DESCRIPTION          Equivalences for array !
####
#AUDIT
C PART-INCLUDE BY ELazarus ON 04-Jul-95 21:09:39 Tue FROM TASK tvec
C MODIFIED BY ELazarus ON 04-Jul-95  20:06:23 Tue FOR TASK tvec
C  Added disest_tim, purge_tim; incremented length by 2.
C PART-INCLUDE BY MVKramer ON 10-May-93 13:05:14 Mon FROM TASK new_cd
C MODIFIED BY MVKramer ON 29-Apr-93  10:17:45 Thu FOR TASK new_cd
C  Added variables num_m_acd_m, msl_acd_mach, and msl_acd in place of
C  cdmisl.
C PART-INCLUDE BY Kramer ON 10-Mar-93 10:18:09 Wed FROM TASK bugfix8
C MODIFIED BY Kramer ON 10-Mar-93  09:22:42 Wed FOR TASK bugfix8
```

```
C  Corrected declaration of skr_sequence it is now dimensioned
C  (MX_SKRS,MX_SKR_STG) instead of (MX_SKRS,MX_SKR_SEQ).
C  Clarified documentation.
C PART-INCLUDE BY Kramer ON 29-Jan-93 09:51:25 Fri FROM TASK bugfix8
C MODIFIED BY Kramer ON 12-Dec-92  10:21:58 Sat FOR TASK bugfix8
C  Extended doc for misaln, gydrft.
C PART-INCLUDE BY Lazarus ON 03-Dec-92 09:41:00 Thu FROM TASK
msl_enhance
C MODIFIED BY Lazarus ON 03-Dec-92  09:35:49 Thu FOR TASK msl_enhance
C  Add bit_ps to mskmsl.
C PART-INCLUDE BY Chinn ON 10-Nov-92 13:06:56 Tue FROM TASK abreather
C MODIFIED BY Chinn ON 01-Oct-92  16:28:53 Thu FOR TASK abreather
C  Removed exarea, This is now part of the engine data.  Added
C  num_engine, the number of engines on a missile.
C PART-INCLUDE BY Kramer ON 22-Apr-92 14:35:07 Wed FROM TASK bugfix8
C MODIFIED BY Kramer ON 22-Apr-92  14:33:54 Wed FOR TASK bugfix8
C  Moved changes over from new_distrib
C PART-INCLUDE BY Kramer ON 22-Apr-92 14:28:30 Wed FROM TASK bugfix7
C MODIFIED BY Kramer ON 22-Apr-92  14:22:54 Wed FOR TASK bugfix7
C  Corrected calculation of lnmsl.  The actual number calculated was
C  correct, but the formulation was in error.
C PART-INCLUDE BY Chinn ON 02-Apr-92 10:03:49 Thu FROM TASK bugfix1
C MODIFIED BY Chinn ON 01-Apr-92  15:15:53 Wed FOR TASK bugfix1
C  Moving code to version new_distrib.
C PART-INCLUDE BY Chinn ON 27-Mar-92 14:47:45 Fri FROM TASK navy_attack
C MODIFIED BY Eiserman ON 25-Mar-92  08:19:21 Wed FOR TASK navy_attack
C  Changed documentation of n_skr_seq, skr_sequence to reflect the fact
C  that they are now always defined.
C PART-INCLUDE BY Bent ON 27-Dec-91 08:26:48 Fri FROM TASK mars
C MODIFIED BY Bent ON 03-Dec-91  13:24:24 Tue FOR TASK mars
C  Added KND_IRSIG and IRSIG_PTR.
C PART-INCLUDE BY Eiserman ON 01-Jun-91 20:03:02 Sat FROM TASK test4
C MODIFIED BY Eiserman ON 01-Jun-91  19:37:43 Sat FOR TASK test4
C  Fixing c* readin line to add new variables
C PART-INCLUDE BY Eiserman ON 24-May-91 19:13:15 Fri FROM TASK msl_test3
C MODIFIED BY Eiserman ON 18-Apr-91  15:04:10 Sat FOR TASK multi_seeker
C  Changed size of skr_sequence from mx_skr to mx_skr,mx_skr_seq
C MODIFIED BY Eiserman ON 11-Mar-91  15:04:10 Sat FOR TASK multi_seeker
C  Replaced gui_tp with comg_capable, skr_tkb_alg, skr_seq_alg,
C  skr_sequence, gui_law_seq and  gui_in_alg
C MODIFIED BY Eiserman ON 19-Jan-91  15:04:10 Sat FOR TASK multi_seeker
C  Changes to accommodate multiple seekers.  Added num_seekers,
skr_dat_ptr,
C skr_type, num_guid, guid_dat_ptr, guid_type.  Replaced nphase, mphase
with
C  gui_tp.  Also moved kndskr to /skrdat/, kndgui to /guidat/
C PART-INCLUDE BY Kramer ON 18-Jan-91 15:32:22 Fri FROM TASK msl_eng
C MODIFIED BY Kramer ON 09-Jan-91  14:43:50 Wed FOR TASK new_misl
C  Added len_engn and len_reig for msl engine types
C  Moved len_engn,len_reig,lenskr,lenfuz,lengui,lenenv,and lenaro to the
C  include file /msl_data_len/.  Removed lenaro, lengui, lenfuz,
C  lenskr, and lenenv.
####
```

ppost

```
#NAME      ppost
#PURPOSE   Holds results of the pilot posture decision
#AUTHOR    Bickley
#CONSTANT DESCRIPTION
 LENPP     INT - Length of the /PPOST/ common block
#VARIABLE DESCRIPTION
 PPOST     ARRAY DIM(LENPP) OF (INT) - dummy equivalence array for mindin,
etc.
 ALTPP     INT - Compact alternative description for pilot posture decision
 NTGTPP    INT - Number of targets
 LTGTPP    ARRAY DIM(MACMND) OF (MM-IND) - Target list indexes
 NTHRPP    INT - Number of threats
 LTHRPP    ARRAY DIM(MACMND) OF (MM-IND) - Threat list indexes
 VMSNPP    REAL - Routepoint value multiplier
 RTEPP     3-VEC - Routepoint
 SPDMPP    REAL - Speed while en route
 TOAPP     REAL - Desired time of arrival at routepoint
 CLMXPP    REAL - Maximum rate-of-climb to use while changeing altitude
 GMXMPP    REAL - Maximum G's to use while route following
 STKPPP    REAL - Value multiplier for formation/support
 IDSUPP    ARRAY DIM(MACELM) OF (INT) - Mutual supportees
 NSUPPP    INT - Number of mutual supportees
 MDSKPP    INT - 1 = formation, 2 = support
 DXW0PP    3-VEC - Formation vector
 DMSLPP    INT - DUMMY (was MSLPP  INT - Missile index)
 MSLMD     INT - Missile mode:
              1 => Get into envelope
              2 => Aim and fire
              3 => Illuminate
              Influences the Maneuver Decision.  No longer has any direct
              impact on fire control.
 PPMENV    LOG - .true. if in envelope
 PPMAPT    3-VEC - Aimpoint (collision position)
 PPMPTR    PTR - Pointer to missile data
 PPMRMN    REAL - Envelope minimum range
 PPMRMX    REAL - Envelope maximum range
 PPM_RPEAKREAL - Location of envelope maximum expressed as a fraction
              of ppmrmx.
 PPM_SEMAX  REAL - Maximum steering angle to fire.
 PPMIAC  MM-IND - Index of best target
 PPMRNG    LOG - .true. if within range
 PPMAIM    LOG - .true. if PPMRNG and PPMSE
 PPMSE     REAL - Steering angle
 PPMTRK    LOG - .true. if radar has lookdown shootdown capability or
              target is above the horizon
 PPMOHR    REAL - Target angle above the horizon
 PPMAOF    REAL - Target angle off
 PPMMSK    INT - MSKMSL for selected weapon
 PPMKND    INT - Kind of best weapon.  See /misdat/kndmsl for definition.
 NOBSPP    INT - Number of aircraft (missiles) to observe
 LOBSPP    ARRAY DIM(MACMND) OF (AC-IND) - List of aircraft to observe
 VECFPP    3-VEC - Vector on which to fly
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 VALFPP   REAL - Value for vectored flight
 SFLYPP   REAL - Speed to use for vectored flight
 PPMJID   AC-IND - Index of selected target
 PPWTIM   REAL - time when start setting switches because weapon tgt
             or type changed
 PP_GUN   LOG - Equals .true. if weapon is a gun
 PP_COMG  LOG - Equals .true. if weapon will be launched command guided
 PP_UNDES LOG - Equals .true. if weapon will be launched undesignated
 PP_SKRS  INT - Bit mask designating which seekers will be on a launch.
             Bits correspond to seeker types defined in /par/
 TSLCT    REAL - Time at which the weapon was selected by SELWPN.
 MPENAL   REAL - Current values of the penalties to be applied to the
             envelope score for delays in launching caused by not having
             seeker acquisition.
 PPMJID_PREV   AC-IDX - Previously selected target.  Used for intent
             messages to determine if selection has been changed.
 PPMKND_PREV   INT - Kind of previous missile selection (see
/misdat/kndmsl
             for definition).  Used for intent messages to determine if
selection
             has changed.
#SLOT/VARIABLE/DESCRIPTION            Equivalences for array _
####
#AUDIT
    C PART-INCLUDE BY ELazarus ON 24-Aug-94 16:18:01 Wed FROM TASK for62
C MODIFIED BY ELazarus ON 22-Jul-94  15:23:10 Fri FOR TASK for62
C  Removed PPIRAQ, PPARAQ, PPIRCG, PPARCG.  Replaced by new variables
C  in the seeker status.
C PART-INCLUDE BY WJBabilon ON 20-May-93 18:19:45 Thu FROM TASK
rand_mods
C MODIFIED BY WJBabilon ON 20-May-93  14:04:08 Thu FOR TASK rand_mods
C  Properietary modification.
C PART-INCLUDE BY RMKerchner ON 03-Jan-92 08:47:09 Fri FROM TASK
intent_msg
C MODIFIED BY RMKerchner ON 28-Dec-91  12:30:26 Sat FOR TASK intent_msg
C  2. Introduced dummy array ppost
C  1. Added ppmjid_prev, ppmknd_prev.
C PART-INCLUDE BY Eiserman ON 06-Dec-91 13:32:04 Fri FROM TASK
wssc_msl_int
C MODIFIED BY Eiserman ON 05-Dec-91  16:09:35 Thu FOR TASK wssc_msl_int
C  Moving changes up from WSSC.
C PART-INCLUDE BY Eiserman ON 05-Dec-91 15:03:15 Thu FROM TASK msl_int
C MODIFIED BY Eiserman ON 24-Oct-91  08:21:53 Thu FOR TASK msl_int
C  Added ppm_rpeak, ppm_semax
C PART-INCLUDE BY Eiserman ON 14-Oct-91 11:19:31 Mon FROM TASK bugfix8
C MODIFIED BY Eiserman ON 06-Sep-91  11:20:19 Fri FOR TASK bugfix8
C  Removed pprtim.  This has been replaced by /mindr/timlcd
C PART-INCLUDE BY Eiserman ON 24-May-91 19:13:33 Fri FROM TASK msl_test3
C MODIFIED BY Eiserman ON 21-Feb-91  13:35:28 Thu FOR TASK skr_reorg
C  Replaced ppnphs, ppmphs with pp_guns, pp_comg, pp_undes, pp_skrs
####
```

prjct

```
#NAME     prjct
#PURPOSE  Holds projection of maneuvers
#AUTHOR   Bickley
#COMMENTS
The variables include those that describe a NOMINAL maneuver and those
that describe the outcome of a particular maneuver.

Variable names utilize the following conventions:
    U - Read as underbar.  U is followed by a suffix indicating
        perspective of attacker (A) or target (T) and whether or not the
        variable is valid for the actual or nominal maneuver (nominal
        manuever variables contain an "N" suffix.
    A - As a suffix, denotes attacker coordinates (see U)
    T - As a suffix, denotes target coordinates (see U)
    E - A prefix denoting Earth coordinates
    W - A prefix indicating a Wind axis coordinate system.  The suffix A
        or T resolves attacker versus target.
    B - A prefix indicating a Body axis coordinate system.

NOTE: Delta vectors, DX and DV, are always position (or velocity) of the
    target relative to the attacker, EVEN WHEN EXPRESSED IN A
    TARGET-CENTERED COORDINATE SYSTEM.
#CONSTANT DESCRIPTION
#VARIABLE DESCRIPTION
 XEUT      ARRAY (MM-IDX) OF (3-VEC) - Target position in earth frame
 VEUT      ARRAY (MM-IDX) OF (3-VEC) - Target velocity in earth frame
 RWEUT     ARRAY (MM-IDX) OF (ORIENT) - Target earth-to-wind rotation
              matrix
 XEUAN     3-VEC - Attacker position in the earth frame (Nom)
 VEUAN     3-VEC - Nominal attacker velocity in the earth frame (Nom)
 RWEUAN    ORIENT - Attacker earth-to-wind rotation matrix (Nom)
 RNGUN     ARRAY (MM-IDX) OF (REAL) - Range (nominal) between A & T
 RNGRUN    ARRAY (MM-IDX) OF (REAL) - Range rate (nominal) between aircraft
 DXEUAN    ARRAY (MM-IDX) OF (3-VEC) - Pos of target rel to attacker
              (nominal maneuver) in Earth coords.
 DVEUAN    ARRAY (MM-IDX) OF (3-VEC) - Vel of T rel to A (nominal
              maneuver) in Earch coordinates.
 DXWUTN    ARRAY (MM-IDX) OF (3-VEC) - DXEUAN in target wind axes
 DVWUTN    ARRAY (MM-IDX) OF (3-VEC) - DVEUAN in target wind axes
 DXWUAN    ARRAY (MM-IDX) OF (3-VEC) - DXEUAN in attacker wind axes
 DVWUAN    ARRAY (MM-IDX) OF (3-VEC) - DVEUAN in attacker wind axes
 DVWUA     ARRAY (MM-IDX) OF (3-VEC) - DVEUAN in attacker wind axes
 RNG       ARRAY (MM-IDX) OF (REAL) - Range between aircraft
 RNGR      ARRAY (MM-IDX) OF (REAL) - Range rate between aircraft
 DXEUA     ARRAY (MM-IDX) OF (3-VEC) - Pos of T rel to A in Earth coordinates
 DVEUA     ARRAY (MM-IDX) OF (3-VEC) - Vel of T rel to A in Earth coordinates
 DXWUT     ARRAY (MM-IDX) OF (3-VEC) - DXEUA in target wind axes
 DVWUT     ARRAY (MM-IDX) OF (3-VEC) - DVEUA in target wind axes
 DXWUA     ARRAY (MM-IDX) OF (3-VEC) - DXEUA in attacker wind axes
 XEUA      3-VEC - Attacker position in the earth frame
 VEUA      3-VEC - Attacker velocity in the earth frame
 RWEUA     ORIENT - Attacker earth-to-wind rotation matrix
```

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 SPDUAN    REAL - Attacker speed (nominal)
 SPDUA     REAL - Attacker speed
 SPDUT     ARRAY (MM-IDX) OF (REAL) - Target speed
 DXBUA     ARRAY (MM-IDX) OF (3-VEC) - DXEUA in attacker body axes
 DVBUA     ARRAY (MM-IDX) OF (3-VEC) - DVEUA in attacker body axes
 RBEUA     ORIENT - Attacker earth-to-body rotation matrix
 DXBUT     ARRAY (MM-IDX) OF (3-VEC) - DXEUA in target body axes
 DVBUT     ARRAY (MM-IDX) OF (3-VEC) - DVEUA in target body axes
 RBEUT     ARRAY (MM-IDX) OF (ORIENT) - Target earth-to-body reference
              frame rotation matrix
 GEESUN    REAL - Nominal G's
 GEES      REAL - G's
 ERATEN    REAL - Nominal energy rate
 ERATE     REAL - Energy rate
 HDNGUN    REAL - Nominal heading
 HDNG      REAL - Heading
 ALFEUN    REAL - Nominal angle of attack
 ALFE      REAL - Angle of attack
 DXBUAN    ARRAY (MM-IDX) OF (3-VEC) - DXEUAN in attacker body axes
 RBEUAN    ORIENT - Nominal attacker earth-to-body reference frame
              rotation matrix
 ABODY     3-VEC - acceleration in body coordinates
 WEUA      3-VEC - angular rates of attacker, earth coordinates
#SLOT/VARIABLE/DESCRIPTION          Equivalences for array _
####
#AUDIT
MODIFIED 11 Dec 1986 by RMKerchner
   Documentation edited
MODIFIED 04 Mar 1986 by RMKerchner
   Documentation edited
MODIFIED 26 Dec 1984 by MHBickley for task btrks
to change dimension of variables from MAC to MACMND
####
```

rdrsta

```
#NAME    rdrsta
#PURPOSE Radar internal status block
#AUTHOR  Kramer
#COMMENTS
   Note: The variables which describe the radar trackbank and
   are not maintained when an SFD is on the aircraft have been
   moved from here to /rdrtbk/.  Note that all of the variables in this
   block are maintained regardless of whether there is an SFD present
   on the aircraft.

   Routines which use but do not modify variables in /rdrtbk/ should
   use utilities provided for that purpose.  Please refer to the
   documentation for /rdrtbk/ for further information.
#CONSTANT DESCRIPTION
   LRDRS          INT - Length of block (excluding currency ptr)
   MMSLSN INT - Dimension of array mslsnc (=5)
   INIINT         INT - Duration (in seconds) of the 'catch up' initialization
                  period for an ESA radar.
#VARIABLE DESCRIPTION
   PTRDRS    PTR - Currency pointer for this block
   RSTA           ARRAY DIM(LRDRS) OF (REAL) - Equivalenced to the first
                  element of the block for convenience when reading or
                  writing the entire block.
   PTBK           PTR - Pointer to /rdrtbk/
   RTASK_PTRPTR - Pointer to /rtask/ for an ESA radar
   ACTTSK_PTR     PTR - Pointer to /acttsk/ for an ESA radar
   NEW_RTASK_PTR  PTR - Pointer to /new_rtask/ for an ESA radar
   UM_RTASK_PTR   PTR - Pointer to /um_rtask/ for an ESA radar
   RTEMPL_PTR     PTR - Pointer to /rtempl/ for an ESA radar
   TSKMOD_PTR     PTR - Pointer to /tskmod/ for an ESA radar
   PRDR_CUM       PTR - Pointer to /dtct_pcum/ random number
                  synchronization
   LEVCTR INT - Look event counter.  Value is incremented whenever a
                  new look event is planted for an ESA radar.  Is used
                  as a check for obsolete events
   TEVCTR    INT - Trackbank event counter. Value is incremented whenever
                  a new trackbank event is planted for an ESA radar.  Is
                  used as a check for obsolete events
   MEVCTR INT - Radar manager event counter.  Value is
                  incremented whenever a new manager event is planted for
                  an ESA radar.  Is used as a check for obsolete events
   OEVCTRINT - Optimizer event counter.  Value is incremented
                  whenever a new optimizer event is planted for an ESA
                  radar.  Is used as a check for obsolete events
   ESAINI LOG - Equals .true. if for an ESA radar during initialization
   RES_TIME REAL - Fraction of radar duty cycle which is to be held in
                  reserve. This is intended to allow the radar manager to be
                  able to start new tasks between radar optimizer passes
                  without exceeding the radar's time constraints. Defined
                  only for ESA radars. This value is set in the user written
                  initialization routine.  Range = 0.0-1.00
   RES_POWER      REAL - Fraction of radar max average power which is to
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be held

               in reserve. This is intended to allow the radar manager to be
               able to start new tasks between radar optimizer passes
               without exceeding the radar's average power constraints.
               Defined only for ESA radars. This value is set in the
               user written initialization routine. Range = 0.0-1.00

NON_MDLD_TIM   REAL - Portion of radar duty cycle which is taken up by
               processes which are not being explicitly modeled but whose
               consumption of resources do need to be taken into account.
               Units are seconds, range = 0.0-1.00

NON_MDLD_PWR   REAL - Amount of radar average power that is taken up
               by processes which are not being explicitly modeled but whose
               consumption of resources do need to be taken into account.
               Units are Watts

RSTANT INT - Antenna number for current antenna.

PTRANTARRAY DIM(MANTEN) OF (PTR) - Pointer to /antsta/ for
               each antenna

PTRSWS ARRAY DIM(MANTEN) OF (PTR) - Pointer to /rdrsws/ for
               each antenna

RADSMD ARRAY DIM(MANTEN) OF (INT) - Current radar mode (allowable
               values are parameters in /par/).

ELVMAN ARRAY DIM(MANTEN) OF (LOG) - .TRUE. if manual control
               is being exercised over radar elevation. The only
               currently available mechanism for manual control is
               production rules.

FRTIME   ARRAY DIM(MANTEN) OF (REAL) - Frame time. This is the
               length of time covered by the current frame event.
               This may or may not be a full frame. If the time taken
               to scan a full frame is desired, use nom_frtime(ianten).

DESLOC ARRAY DIM(MANTEN) OF (LOG) - Indicates desire for STT mode

TGTLOC ARRAY DIM(MANTEN) OF (AC-IDX) - Tgt attempting to STT lock on
               May be set by the pilot or by production rules through a
               call to prrdr. Zero if in STT or not in STT and not
               actively trying to obtain STT lock.

RADTGT ARRAY DIM(MANTEN) OF (AC-IDX) - Tail number of a/c locked on
               in STT. Zero if antenna not in STT.

MSLSNC ARRAY DIM(MMSLSN) OF (MSL-NUM) - List of missiles for
               which bistatic signal to noise calculations are required when
               target is swept.

NMSLSN INT - Actual number of missiles on the MSLSNC list

RSCOPL REAL - Maximum range at which radar scope is currently capable
               of displaying a target; this is presumably a function of pilot
               settable switch settings and is no reflection of the
               ability of the radar to track the target internally.
               Added to permit production rules to alter the maximum
               scope range limit using routine prrscl.

MXAZB REAL - Approximate maximum azimuth in body coordinates that
               is within the FOR of any antenna. This is used for planning
               purposes only any does not affect radar performance.

MNAZB REAL - Approximate minimum azimuth in body coordinates that
               is within the FOR of any antenna. This is used for planning
               purposes only any does not affect radar performance.

MXELB REAL - Approximate maximum elevation in body coordinates that
               is within the FOR of any antenna. This is used for planning

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                         purposes only any does not affect radar performance.
     MNELB REAL - Approximate minimum elevation in body coordinates that
                         is within the FOR of any antenna. This is used for planning
                         purposes only any does not affect radar performance.
     TCRDR LOG - .true. if /tracks/ has been filled for this radar
                         since any TWS track's contents were last changed.
!!The following variables refer to the last hit on a "track".  In this
!!context, "track" refers to a unique track ID number from either
!!the radar trackbank (/rdrtrk/trkid) or the SFD trackbank
(/sfds/sfdtid)
!!These are unpacked arrays.
!!PLEASE USE UTILITIES RRLSTH AND RRTKLH TO ACCESS THESE VARIABLES.
     NHIT  INT - The number of "tracks" referenced by hitid, lsthit,
                         mlhit, tlhit, tlmtts.
     HITID  ARRAY DIM(MRDTRK) OF (TRK-ID) - This cross-reference array
                         holds the unique ID number for a track that the radar has
                         hit.  This ID comes either from the radar trackbank
                         (/rdrtrk/trkid) or the SFD trackbank (/sfds/sfdtid)
     LSTHITARRAY DIM(MRDTRK) OF (INT) - Antenna number of the
                         last antenna to make a detection of this track.  Zero
                         if no detection has been made.  Parallel to HITID.
     MLHIT ARRAY DIM(MRDTRK) OF (INT) - mlhit(i) contains the mode of
                         antenna lsthit(i) at the time that the hit occurred.
                         Parallel to HITID.
     TLHIT  ARRAY DIM(MRDTRK) OF (REAL) - tlhit(i) contains the time that
                         the hit referred to by lsthit(i) and mlhit(i) occurred.
                         Parallel to HITID.
     TLMTTSARRAY DIM(MRDTRK) OF (REAL) - Time at which the last MTT hit
                         was scheduled for this track.  Parallel to HITID.
    NOM_FRTIME     ARRAY DIM(MANTEN) OF (REAL) - Nominal frame time.  This
is the
                         time taken to scan an entire frame.  This may or may not
                         be the length of time covered by the current frame event.
                         If the time covered by the current frame event is desired,
                         use frtime(ianten).
#SLOT/VARIABLE/DESCRIPTION              Equivalences for array _
####
#AUDIT
C PART-INCLUDE BY Eiserman ON 18-Jul-92 12:41:58 Sat FROM TASK esa_test
C MODIFIED BY Eiserman ON 27-Apr-92  10:25:33 Mon FOR TASK esa_test
C  Reduced iniint from 10 to 5 seconds
C PART-INCLUDE BY Kramer ON 06-Apr-92 11:23:25 Mon FROM TASK bugfix
C MODIFIED BY Kramer ON 01-Apr-92  18:39:43 Wed FOR TASK bugfix
C  added nom_frtime
C PART-INCLUDE BY Eiserman ON 24-Jan-91 09:28:05 Thu FROM TASK aesa_mods
C MODIFIED BY Eiserman ON 24-Jan-91  09:21:16 Thu FOR TASK aesa_mods
C  Added new variables non_mdld_tim, non_mdld_pwr for ESA radars
C PART-INCLUDE BY Chinn ON 07-Jan-91 14:14:09 Mon FROM TASK num_sync
C MODIFIED BY Chinn ON 20-Dec-90  10:09:53 Thu FOR TASK num_sync
C  Added pointer prdr_cum
C PART-INCLUDE BY Kramer ON 11-Dec-90 17:28:24 Tue FROM TASK aesa_mods
C MODIFIED BY Eiserman ON 11-Sep-90  14:21:28 Tue FOR TASK aesa_mods
C  Added variables res_time, res_power
C MODIFIED BY Eiserman ON 11-Sep-90  14:21:28 Tue FOR TASK aesa_mods
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C  Added the following variables:  levctr,tupdtm,rtask_ptr,acttsk_ptr,
C    new_rtask_ptr,um_rtask_ptr,rtempl_ptr,tskmod_ptr
C  Added the parameter iniint and the variables esaini
C PART-INCLUDE BY Kramer ON 19-Jul-90 09:24:20 Thu FROM TASK
rdr_trackbank
C MODIFIED BY Kramer ON 18-Jun-90  10:24:43 Mon FOR TASK rdr_trackbank
C  Combined the four separate trackbanks into a single trackbank:
C  Removed variables lsthm, mlhitm, tlhitm, tlmttm, xrfspt, rsnpts,
C    trkstm, xrftm, rtkmpt, xrftsm, rsnmpt, xrftpt.
C  Redefined lsthit, mlhit, tlhit to tlmtta to refer to tracks instead
C    of a/c.
C  Renamed tlmtta tlmtts for Time_Last_MTT_Scheduled
C  Added nrdrtk, trkent, xrid, xrtknm.
C  Moved a lot of variables to /rdrtbk/ and added a pointer to that
block.
C  There is now a logical split between /rdrsta/ and /rdrtbk/.
C  Everything in /rdrsta/ is maintained regardless of whether there is
C  an SFD on the aircraft.  /rdrtbk/, in contrast, is NOT maintained if
C  there is an SFD on the aircraft.
C PART-INCLUDE BY Kramer ON 26-Feb-90 15:34:42 Mon FROM TASK bugfix2
C MODIFIED BY Kramer ON 19-Feb-90  11:51:10 Mon FOR TASK bugfix2
C Added tcrdr
####
```